060/1 Engin
U.S. Patent Office.
260

Vol. 1060 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

The University of Michigan Engineering Library

Route to:

PATENTS

November 5, 1985

LIBRARIES
NOV 25 1985
DEPOSITED BY

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

November 5, 1985 Volume 1060 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1060 OG 2
Notice of Maintenance Fees Payable	1060 OG 2
Reissue Applications Filed	1060 OG 3
Requests for Reexaminations Filed	1060 OG 3
Service by Publication	1060 OG 3
Errata	1060 OG 3
Application for Recordation of Trade Name	1060 OG 3
Plant Life — Patentable Subject Matter	1060 OG 4
Patent Certificates of Correction	1060 OG 5
Erratum	1060 OG 5
Disclaimers	1060 OG 5
Errata	1060 OG 5
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1060 OG 6
Condition of Patent Applications	1060 OG 7
Reexaminations	1
Defensive Patent Publications (106,001)	5
Reissue Patents Granted (32,017)	7
Plant Patents Granted (5,579)	11
Patents Granted	
General and Mechanical (4,550,445)	13
Chemical (4,551,150)	259
Electrical (4,551,575)	381
Design Patents Granted (281,200)	481
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 54
Index of Applicants of Defensive Publications	PI 57
Classification of	
Patents (Including Reissues and Reexaminations)	PI 59
Designs, Plants and Defensive Publications	PI 62
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 63
Designs, Plants and Applicants of Defensive Publications	PI 64
Change of Address Form and Subscription Order Form	Back Page

THE UNIVERSITY OF MICHIGAN
DEC 11 1985
ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	
if paid before Oct. 5, 1985	$ 125.00
if paid on or after Oct. 7, 1985	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	
if paid before Oct. 5, 1985	500.00
if paid on or after Oct. 7, 1985	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Oct. 12, 1985	680.00
if paid on or after Oct. 15, 1985	750.00
International fees	
Basic fee (first 30 pages):	
if paid before Oct. 29, 1985	230.00
if paid on or after Oct. 29, 1985	280.00
Basic Supplemental fee (for each page over 30):	
if paid before Oct. 29, 1985	4.00
if paid on or after Oct. 29, 1985	6.00
Designation fee (for the first 10 national or regional offices):	
if paid before Oct. 29, 1985	55.00
if paid on or after Oct. 29, 1985	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Aug. 28, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 2, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,356,569 through 4,357,713
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,397,648, Re. S.N. 762,051, Filed Aug. 2, 1985, Cl. 604/253, DROP SENSING UNIT AND ASSOCIATED DRIP CHAMBER FOR IV FLUID ADMINISTRATION, Wallace L. Knute, Owner of Record: *IVAC Corp., San Diego, Calif.,* Attorney or Agent: Edward J. Lynch, et al., Ex. Gp.: 336

4,404,589, Re. S.N. 770,396, Filed Aug. 28, 1985, Cl. 358/086, CABLE TELEVISION WITH MULTI-EVENT SIGNAL SUBSTITUTION, W. Andrew Wright, Jr., Owner of Record: *Information Resources, Inc., Chicago, Ill.,* Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 261

4,493,661, Re. S.N. 774,661, Filed Sept. 11, 1985, Cl. 440/077, OUTBOARD ENGINE, Tomio Iwai, Owner of Record: *Yamaha Hatsudoki Kabushiki Kaisha, dba Yamaha Motor Co., Ltd., Shizuoka-Ken, Japan and Shanshin Kogyo Kabushiki Kaisha, Shizuoka-Ken, Japan,* Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 315

4,509,741, Re. S.N. 772,481, Filed Sept. 3, 1985, Cl. 272/069, HEIGHT ADJUSTABLE CRUTCH, Alfred A. Smith, Owner of Record: *Guardian Products Co., Inc., Hollywood, Calif.,* Attorney or Agent: William H. Pavitt, Jr., et al., Ex. Gp.: 331

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Who Cares, Inc., Ridgewood, N.Y., Reg. No. 1,030,885, for the mark "SIMON SEZ", Canc. No. 14,938.

Total Person Institute, Inc., Marrietta, Ga., Reg. No. 1,201,594, for the mark "NUTRIONICS and design", Canc. No. 14,659.

The Griffin Ltd., Estes Park, Colo., Reg. No. 1,137,867, for the mark "THE GRIFFIN LTD. and design", Canc. No. 14,816.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Erratum

The following registration number was erroneously listed as cancelled and restored to pendency as Trademark Application Serial No. 446,893, in the "Inadvertently Issued Registration Numbers" section of the Trademark Official Gazette of Sept. 10. 1985:

1,328,126	TM 208	Sept. 10, 1985

Consequently, Registration No. 1,328,126 is still active.

Oct. 7, 1985. PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Erratum

The following registration number was inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazette of Sept. 17, 1985:

1,088,841	TM 211	Sept. 17, 1985

Consequently, the above-identified registration is still active.

Sept. 23, 1985. PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Department of the Treasury United States Customs Service Application for Recordation of Trade Name: "CRYOMEC, INC."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CRYOMEC, INC." used by Cryomec, Inc., a corporation organized under the laws of the State of California, located at 1265 N. Kraemer Blvd., Anaheim, Calif. 92806.

The application states that the trade name is used in connection with the following goods, manufactured in the United States: pumps, particularly reciprocating and centrifugal pumps for cryogenic liquids, cryogenic vaporizers, and conversion systems for converting cryogenic liquids to a gas, and related equipment, including heat exchangers.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Nov. 23, 1985.

Address: Written comments should be addressed to the Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

Sept. 18, 1985. STEPHEN PINTER,
Acting Director, Entry Procedures and Penalties Division.

Plant Life — Patentable Subject Matter

The decision by the Board of Patent Appeals and Interferences in Ex Parte Hibberd (Sept. 18, 1985) held that the Plant Patent Act (35 USC 161–164) and the Plant Variety Protection Act (7 USC 2321 et seq.) do not represent the exclusive forms of protection for plant life covered by these acts, and that there is no irreconcilable conflict between these plant-specific statutes and 35 USC 101. It is clear from the Board decision that plant life is not excluded from patent protection under 35 USC 101.

Accordingly, the Patent and Trademark Office is now examining applications including claims to plant life — e.g., plants per se, seeds, plant parts. To the extent that the claimed subject matter is directed to a "nonnaturally occurring manufacture or composition of matter — a product of human ingenuity" (*Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980)), such claims will not be rejected under 35 USC 101 as being directed to unpatentable subject matter.

DONALD J. QUIGG,
Oct. 8, 1985. *Commissioner of Patents and Trademarks—Designate.*

PATENT NOTICES

Certificates of Correction for the Week of Nov. 5, 1985

Re. 31,518	4,467,246	4,506,667	4,521,940
Re. 31,617	4,468,443	4,507,236	4,522,627
D. 279,128	4,470,831	4,507,886	4,522,662
D. 279,750	4,473,772	4,508,559	4,522,685
4,218,834	4,474,641	4,508,813	4,523,462
4,265,039	4,474,656	4,508,911	4,524,852
4,296,021	4,475,136	4,510,138	4,525,036
4,317,678	4,478,045	4,510,669	4,525,105
4,327,224	4,478,622	4,510,816	4,525,406
4,336,513	4,479,966	4,511,025	4,526,141
4,347,619	4,480,757	4,511,784	4,526,518
4,363,774	4,482,312	4,512,896	4,527,781
4,364,946	4,482,637	4,513,175	4,528,034
4,380,782	4,483,393	4,514,263	4,528,062
4,398,851	4,490,883	4,514,399	4,528,066
4,414,950	4,494,216	4,514,401	4,528,304
4,418,399	4,495,219	4,514,935	4,529,307
4,419,545	4,496,557	4,515,587	4,529,535
4,419,837	4,497,869	4,516,750	4,530,034
4,429,435	4,498,256	4,516,864	4,530,463
4,430,851	4,498,714	4,517,389	4,531,092
4,431,212	4,498,967	4,517,391	4,531,235
4,432,068	4,499,091	4,518,469	4,531,592
4,433,380	4,499,157	4,518,615	4,531,851
4,436,745	4,499,556	4,518,631	4,532,805
4,438,593	4,500,392	4,519,024	4,532,826
4,448,635	4,500,716	4,519,270	4,533,158
4,454,632	4,500,871	4,519,292	4,533,563
4,456,595	4,501,978	4,519,869	4,533,774
4,456,840	4,502,774	4,520,480	4,534,094
4,456,868	4,503,243	4,521,103	4,536,704
4,457,473	4,504,449	4,521,413	4,537,549
4,460,579	4,504,865	4,521,488	4,538,371
4,462,943	4,505,264	4,521,497	4,539,448
4,463,488	4,506,503	4,521,591	

Erratum

In the notice of Certificates of Correction appearing in 1058 OG 4, dated Sept. 24, 1985, Patent No. 4,505,434 should be corrected to read — 4,504,434 —.

Disclaimers

4,392,882.—*Hans-Jochem Riebel,* Wuppertal; *Ludwig Eue,* Leverkusen; and *Wilfried Faust,* Odenthal, all of Fed. Rep. of Germany. N-N-BIS(HALOACYL)-DIAZA-CYCLOAL-KANES FOR PROTECTING PLANTS FROM HERBICIDE DAMAGE. Patent dated July 12, 1983. Disclaimer filed Aug. 22, 1984, by the assignee, *Bayer Aktiengesellschaft.*

Hereby enters this disclaimer to all claims of said patent.

4,474,317.—*Roy W. Lessard,* Apple Valley, Calif. PANTS RACK. Patent dated Oct. 2, 1984. Disclaimer filed May 10, 1985, by the *inventor.*

The term of this patent subsequent to July 2, 2000 has been disclaimed.

Errata

In the notice of Disclaimers appearing in the Aug. 13, 1985 Official Gazette (1057 O.G. 14) all references to Patent No. 4,474,317, should be deleted.

In the notice of Disclaimers appearing in the Aug. 13, 1985 Official Gazette (1057 O.G. 14) all references to Patent No. 4,392,882, should be deleted.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 30, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	6-07-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-30-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-05-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-27-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during September 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,399,406 to 3,403,405, inclusive

Plant Patents ..... Numbers 2,830 to 2,834 inclusive

REEXAMINATIONS

NOVEMBER 5, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,928,163 (411th)

SPARK DISCHARGE AND ELECTRO-CHEMICAL EROSION MACHINING APPARATUS

Werner Ullmann, Locarno; Bernd Schumacher, Losone; Silvano Mattei, Locarno-Solduno; Hans-Ueli Fenner, Ascona, and Arno Sieg, Locarno, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

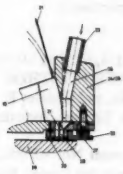
Reexamination Request No. 90/000,629, Sep. 17, 1984.

Reexamination Certificate for Patent No. 3,928,163, issued Dec. 23, 1975, Ser. No. 463,317, Apr. 23, 1974.

Claims priority, application Switzerland, Sep. 11, 1973, 13062/73

Int. Cl.[4] B23P *1/04, 1/08*

U.S. Cl. 204—206



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** and **13–16** is confirmed.

Claim **12** is determined to be patentable as amended.

New claims **17–24** are added and determined to be patentable.

1. An electro-erosion machine tool comprising a filamentary erosion electrode **(21)** and electrode guide and fluid delivery means, said electrode guide and fluid delivery means comprising a portion forming a guide for receiving said filamentary erosion electrode **(21)** and guiding movement of the electrode in the direction of the electrode axis, a portion defining an outlet for discharging a fluid medium alongside of said electrode in contact with the outer surface thereof and parallel to the axis thereof towards a working area of said electrode, and a portion providing duct means for leading said fluid medium from a supply conduit to said outlet in such a way as to cause said fluid medium to be discharged through said outlet as aforesaid when supplied from said supply conduit.

10. A spark-discharge erosion machine tool comprising supporting and guiding means **(1)** for supporting and guiding movement of a filamentary erosion electrode **(2)**, fluid delivery means **(4)** which is positioned near the supporting and guiding means and which comprises portions defining an outlet for passing a dielectric flushing medium to a working area of said electrode to assist erosion thereby, collecting means **(5** and **6)** positioned and constructed for collecting used flushing medium passing from said working area, and a regeneration system which is constructed and arranged for receiving said used flushing medium from said collecting means, for regenerating it and for returning it to said fluid outlet means, the regeneration system including conductivity determining means **(12)** operably connected for determining the conductivity of said used flushing medium, and deionising means **(14)** which is connected for being brought into operation to deionise said used flushing medium under the control of said conductivity determining means when the conductivity of the used flushing medium rises above a predetermined level.

B1 4,099,020 (412th)

APPARATUS FOR SEALING PASSAGES THROUGH A CONCRETE FLOOR AND ABOUT A CONDUCTOR

John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.

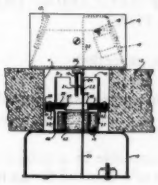
Reexamination Request No. 90/000,633, Sep. 21, 1984.

Reexamination Certificate for Patent No. 4,099,020, issued Jul. 4, 1978, Ser. No. 745,791, Nov. 29, 1976.

Continuation-in-part of Ser. No. 436,500, Jan. 25, 1974, Pat. No. 3,995,102.

Int. Cl.[4] A62C *3/16*

U.S. Cl. 174—48



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **2** is confirmed.

1. An insert device and apparatus for sealing passages through a floor, upon occurence of fire or excess temperatures, in a substantially solid structural member, said structural member having an opening formed therein and therethrough perpendicularly to the longitudinal axis thereof,

said insert device being adapted to be positioned in said opening, whereby cables may be passed through said insert device, and thereby through said structural member, said insert device comprising:

an insert housing proportioned to be so perpendicularly positioned in said opening in the structural member,

said insert housing including a wall member defining a continuous cable-receiving opening therein,

said wall member proportioned to be snugly positioned in said vertical opening in the structural member,

plate means in said housing positioned in said housing wall intermediate the length thereof and second plate means positioned at the lower end of said wall member,

said plate means having registering apertures therein for passage therethrough, and thus through the structural member, of cables,

an elongated hollow, cable-passage, fire-retarding member positioned on the second plate means and intermediate both plate means in alignment with said apertures therein,

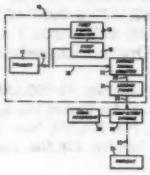
said fire retarding means formed of material enabling passage of cables therethrough at normal room temperatures, but automatically expanding and closing the opening therethrough and in said wall member and sealing the cables therein on occurence of excess heat or fire, thereby sealing the housing and said structural member opening.

B1 4,275,727 (413th)

DEVICE FOR MONITORING AND CONTROLLING SELF-ADMINISTERED INTRAVENOUS DRUG DOSAGE

Michael Keeri-Szanto, 10 Beechwood Pl., Apt. 612, London, Ont., Canada N6C 1H7.

Reexamination Request No. 90/000,379, May 10, 1983.
Reexamination Certificate for Patent No. 4,275,727, issued Jun. 30, 1981, Ser. No. 109,928, Jan. 7, 1980.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—66



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are cancelled.

[1. A device for monitoring and controlling the operation of a motorized syringe to dispense a predetermined drug dosage comprising:

(a) trigger means operable by a patient to initiate a demand signal indicative of a demand for an individual drug dose,

(b) first signal monitor means adapted to record the total number of occasions on which said demand signal is initiated by operation of said trigger means;

(c) first timer means for receiving said demand signal and selectively rejecting said demand signal or emitting said demand signal as an inject signal,

(d) second signal monitor means adapted to record the total number of occasions on which said first timer means emits a demand signal,

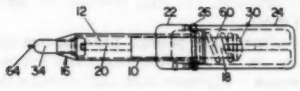
(e) second timer means for receiving said inject signal, said second timer means being operable on receipt of said inject signal to activate said motorized syringe for a preselected time period to dispense a predetermined individual dose of drug.]

B1 4,330,280 (414th)

EJECTOR HOLDER FOR CAPSULE-LIKE CARTRIDGE

Emery W. Dougherty, and Richard E. Welsh, both of Milford, Del., assignors to Dentsply Research & Development Corp., Milford, Del.

Reexamination Request No. 90/000,669, Nov. 13, 1984.
Reexamination Certificate for Patent No. 4,330,280, issued May 18, 1982, Ser. No. 252,558, Apr. 9, 1981.
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—90



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

New claim **5** is added and determined to be patentable.

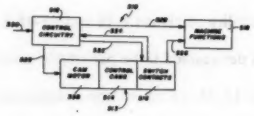
1. A manually operable ejector holder and a loaded capsule-like cartridge in which said cartridge has an annular collar on one end and a discharge tip on the other, and said holder comprising in combination, an elongated barrel, a plunger reciprocable therein and one end projecting beyond said barrel, manually operable lever means on one end of said barrel operable to reciprocate said plunger relative to the other end of said barrel, and said other end of the barrel being cutaway longitudinally a limited distance to provide a compartment having sidewalls extending a limited distance beyond the axis of said barrel, an undercut groove formed in said compartment within said sidewalls to receive the annular collar on said cartridge to prevent relative axial movement between said cartridge and compartment, and the outer longitudinally-extending portions of the sidewalls of said compartment having limited flexibility and extending toward each other a slightly lesser distance than the diameter of said cartridge to effect a snap-acting retaining means for said cartridge when inserted into said compartment.

B1 4,378,566 (415th)

APPLIANCE CONTROL SYSTEM

Leroy A. Perry, Danville, and Charles E. Scott, Noblesville, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Reexamination Request No. 90/000,599, Jul. 30, 1984.
Reexamination Certificate for Patent No. 4,378,566, issued Jan. 25, 1983, Ser. No. 254,377, Apr. 15, 1981.
Int. Cl.[4] H01H *43/00*
U.S. Cl. 307—141



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 3, 5, 8, 9, 14** and **15** are cancelled.

Claims **1, 4, 6, 7** and **13** are determined to be patentable as amended.

Claims **10–12**, dependent on an amended claim, are determined to be patentable.

1. A control system for an appliance having a plurality of different operational cycles, comprising:

cam operated switch means for controlling the coupling of electrical power to the appliance, said *cam operated* switch means including a plurality of rotatable cams for operating said *cam operated* switch means in response to the rotational position of said *rotatable* cams, said switch means being adapted for electrical rotation of said cams;

digital electronic control circuit means for controlling said electrical rotation, said *digital electronic* control circuit means including means for receiving a selection of any one of said cycles for the operation of said appliance; [and]

second circuit means *including at least one cam of* [coupled between] said *cam operated* switch means *coupled to* [and] said *digital electronic* control circuit means, *said cam* [and] responsive to said means for receiving *a selec-*

tion of any one of said cycles for supplying information on the rotational position of said [cams] *cam* to said *digital electronic* control circuit means to enable control of said electrical rotation in accordance with a cycle selection[.]; *and*

means transferring timing increments on said cams to said digital electronic control circuit for each event of a plurality of events of said cycle selection prior to termination of said event.

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 5, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T106,001
APPARATUS FOR THE ELECTROLYTIC GENERATION OF ALKALI ON BOTH SIDES OF A SUBSTRATE

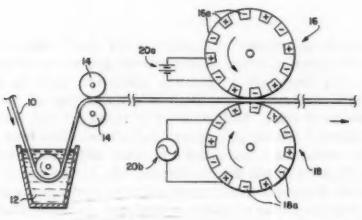
Kurt A. Dellian, 1201 Wakefield Rd., Greensboro, N.C. 27410

Continuation of Ser. No. 599,219, Apr. 13, 1984, abandoned, which is a continuation of Ser. No. 369,638, Apr. 19, 1982, abandoned. This application Nov. 7, 1984, Ser. No. 669,744

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—212

2 Sheets Drawing. 22 Pages Specification



An apparatus for the electrolytic generation of alkali on both sides of a substrate of hydrophilic material having applied thereto an alkali metal salt includes a pair of rollers positioned to rotate in contact with opposite sides of a substrate. Each roller has spaced around the periphery thereof a plurality of electrodes. Current of opposite polarities is applied to alternate electrodes on each roller, thereby to electrolytically generate alkali or acid on both sides of the substrate. The current may be DC, or alternatively may be AC at a low frequency. In an alternative arrangement the two rollers are replaced by a pair of endless belts of electrically conductive material positioned to move in contact with opposite sides of the substrate. An AC current at a low frequency is applied to the two belts, thereby to electrolytically generate alkali or acid on both sides of the substrate.

T106,002
SINGLE FLOAT STEP PHOSPHATE ORE BENEFICIATION

Alexander D. Mair, Rte. 7, Box 143, and Myra M. Soroczak, Rte. #9, Box 420, both of Florence, Ala. 35630

Filed Mar. 6, 1985, Ser. No. 708,914

Int. Cl.[4] B03B *1/00*

U.S. Cl. 209—9

No Drawing. 31 Pages Specification

A flotation process is taught for beneficiating phosphate ores containing, as impurities, silica and alkaline earth metal carbonates, particularly dolomite. Using a single flotation stage, the phosphate values are recovered in the overflow and quite unexpectedly both the siliceous and the carbonate gangue minerals are simultaneously removed in the underflow. Prior to flotation, surfaces of the minerals in the phosphate ore are selectively sulfidized with an insoluble copper-containing metal sulfide, permitting use of sulfide mineral collecting reagents such as alkyl xanthates in the flotation step to achieve a high degree of selectivity.

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 1, 1983

[illegible]

[illegible]

[illegible]

[illegible]

REISSUES

NOVEMBER 5, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

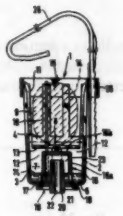
Re. 32,017
TOILET FLUSH WATER COLORIZER

Horst Hautmann, Neuburg, and Georg Schimanski, Hagen, both of Fed. Rep. of Germany, assignors to Globol-Werk GmbH, Neuburg, Fed. Rep. of Germany

Original No. 4,168,551, dated Sep. 25, 1979, Ser. No. 899,289, Apr. 24, 1978. Application for reissue Sep. 29, 1982, Ser. No. 427,493

Int. Cl.⁴ E03D *9/02*

U.S. Cl. 4—231 **8 Claims**



1. A toilet flush water colorizer comprising a container adapted for receiving therein a flush water-coloring block and having at least one entry opening *in the upper part of said container* for admitting *said* flush water thereinto and outlet means for the discharge of colored flush water from said container, said colorizer further comprising means for suspending said container at the inside of a toilet bowl, a diluting chamber in the lower part of the interior of said container and adapted for collecting drops of color concentrate dripping off a block after each flushing; supporting means in said container across the upper end of said diluting chamber and adapted for supporting a flush water-coloring block in the upper part of said container above said diluting chamber, said supporting means having at least one opening for permitting flush water to pass from the upper part of said container into said diluting chamber, said container having a bottom and side walls, said side walls being closed up to the upper end of said diluting chamber, and wherein said outlet means are located in the bottom of said container in communication with said diluting chamber and comprise siphoning means having a siphon passage the apex of which passage is below said upper end of said diluting chamber and below the level of said supporting means, said siphoning means being adapted for siphoning off flush water from said diluting chamber down to a minimum sump level.

Re. 32,018
METHOD OF PRODUCING SEALED PACKAGING CONTAINERS

Klaus Domke, and Walter Saur, both of Ditzingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

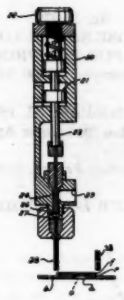
Original No. 4,290,253, dated Sep. 22, 1981, Ser. No. 104,898, Dec. 18, 1979. Application for reissue Mar. 8, 1982, Ser. No. 356,160

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856021

Int. Cl.⁴ B65B *51/02, 1/28, 3/18*

U.S. Cl. 53—480 **6 Claims**

8. A method of sealing a valve attached to a surface of a packaging container which valve includes two superimposed members one of which is attached to the container and having an opening communicating with the interior of the container and a second one being formed of a flexible material, said members when attached to each other forming a valve channel therebetween, the method comprising the step of applying a non-curing sealing fluid to at least one end of said channel to produce a fluid film in said channel, whereby, said flexible member may be lifted by expanded



gases which may occur in the closed container and said film may be broken to enable said gases to escape from said container and thereafter inherently reseal.

Re. 32,019
METHODS OF AND/OR MEANS FOR INDICATING THE LEVELS OF LIQUIDS

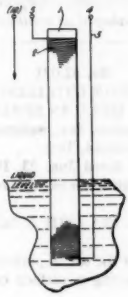
Dougald S. M. Phillips, and Peter A. J. Phillips, both of Hamilton, New Zealand, assignors to AHI Operations Limited, Manukau City, New Zealand

Original No. 4,229,972, dated Oct. 28, 1980, Ser. No. 42,106, May 24, 1979. Application for reissue Oct. 18, 1982, Ser. No. 434,851

Claims priority, application New Zealand, May 26, 1978, 187387

Int. Cl.⁴ G01F *23/24*

U.S. Cl. 73—304 R **15 Claims**



1. A method of indicating the level of an electrically conducting liquid milk in a vessel which contains a vertically disposed rod type resistor having adjacent lengths having an average cross sectional dimension between twenty and forty-five mm and a resistance of between three and thirty-two ohms per mm of length of the resistor, said method comprising the steps of (a) allowing the liquid *milk* to rise in the vessel in a manner such that the liquid *milk* interconnects the adjacent

lengths of the resistor thus changing the impedance of the resistor appearing at the terminals thereof, (b) measuring [that] *said* change of impedance and (c) converting [the] *said* change of impedance into a display which indicates change of level of liquid *milk* in the vessel, whereby said dimension enables the total area of the resistor in contact with the *liquid* milk to be sufficiently great to allow a good resistance connection to the *liquid* milk in contact with it and enables extremely small changes of impedance to be measured in step (b).

Re. 32,020

MULTIPLE-PURPOSE SAW BLADE SUSPENSION ARRANGEMENT FOR RECIPROCATING SAWS

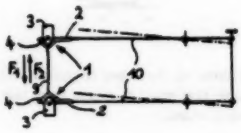
Helmut Abel, 43 Ave. Berryer, 78600 Maisons-Lafitte, Paris, France

Original No. 3,878,876, dated Apr. 22, 1975, Ser. No. 431,930, Jan. 9, 1974. Application for reissue Apr. 18, 1983, Ser. No. 486,027

Claims priority, application France, Feb. 14, 1973, 73.05102; Apr. 9, 1973, 73.12617

Int. Cl.[4] B27B *19/02;* **B23D** *49/06*

U.S. Cl. 83—783 **10 Claims**



1. In a saw frame, a saw blade suspension arrangement for a saw blade (9) which is fixed at or adjacent its opposite ends to the saw frame (10), comprising

a clamping element (3, 5, 6, 7) located adjacent at least one end of the blade for attachment to the saw blade (9);

a fork-shaped element (2, 11, 14, 14') disposed at one end of said frame and rockably mounting said clamping element on the outside of the saw frame, to permit the saw blade (9) to extend through the fork gap to its opposite end attachment to maintain the clamping element in engagement, said rockable fork-shaped element and the clamping element being shaped to form a projecting fulcrum on one of said elements and a V-shaped or similarly shaped hollow seat in the other one of said elements, *the projecting fulcrum comprising a contact edge providing essentially a line contact with said V-shaped or similarly shaped hollow seat.*

Re. 32,021

SURGICAL RETRACTOR UTILIZING ELASTIC TUBES FRICTIONALLY HELD IN SPACED NOTCHES

Frank B. Scott, Jr., Houston, Tex., assignor to Lone Star Medical Products, Inc., Houston, Tex.

Original No. 4,274,398, dated Jun. 23, 1981, Ser. No. 38,469, May 14, 1979. Application for reissue Jun. 22, 1983, Ser. No. 506,624

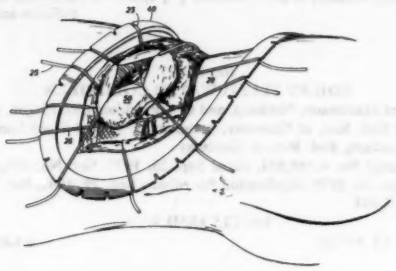
Int. Cl.[4] A61B *17/02*

U.S. Cl. 128—20 **8 Claims**

1. A surgical retractor for use in performing surgery upon a portion of the body having a surface contour, which comprises:

a generally annular frame conformed to fit the surface contour of the portion of the body to be operated upon, said frame having a periphery, said periphery having a plurality of notches having a width and depth spaced thereabout;

a stay which includes an elastic member having a length and a width and tissue holding means attached thereto, wherein the width of said elastic member is greater than the width of said notches such that said elastic member is held in place by friction when inserted into one of said notches; and



said elastic member includes a section of *hollow* elastic tubing and said tissue holding means including a hook having a handle portion inserted in said tubing.

Re. 32,022

ATOMIC ABSORPTION SPECTROSCOPY

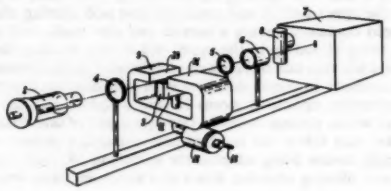
Clive Parker, Roseland, Fla.; Antony Pearl, deceased, late of Park Orchards, Australia, and by Edmund Calvert, administrator, 4 Withers Place, Weston, Australia, assignors to Varian Associates, Inc., Palo Alto, Calif.

Original No. 4,341,470, dated Jul. 27, 1982, Ser. No. 810,232, Jun. 22, 1977. Continuation of Ser. No. 376,498, Jul. 5, 1973, abandoned, which is a continuation of Ser. No. 208,772, Dec. 16, 1971, abandoned. Application for reissue Jul. 26, 1984, Ser. No. 634,771

Claims priority, application Australia, Jan. 5, 1971, 364371

Int. Cl.[4] G01N *21/72, 21/74*

U.S. Cl. 356—307 **31 Claims**



31. Atomic spectrum analysis apparatus for elements exhibiting an anomalous Zeeman splitting characteristic including a light source made from an element exhibiting an anomalous Zeeman splitting characteristic, atomizing means for directing a cloud of an atomized sample into the path of a beam of light emitted by said source, photoelectric detection means for detecting and measuring the intensity of a selected spectral line of the atomic emission spectrum of said light source after said line has passed through said atomized sample, and transverse constant magnetic field means operative upon said atomized sample to cause anomalous Zeeman splitting of the absorption profile of said cloud of atoms, means to cause said photoelectric detection means to sense the effect of said splitting in the relationship between said selected emission line and a corresponding absorption line of said atomized sample, wherein said means to cause said photoelectric detection means to sense the effect of said splitting includes variable polarization means.

Re. 32,023

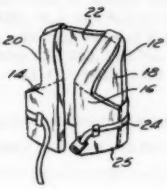
FLOTATION VEST

Robert G. Harr, Whittier, and Gaylord T. Soli, San Marino, both of Calif., assignors to America's Cup, Inc., City of Industry, Calif.

Original No. 4,380,441, dated Apr. 19, 1983, Ser. No. 239,460, Mar. 2, 1981. Application for reissue Feb. 6, 1984, Ser. No. 577,524

Int. Cl.⁴ B63C *9/08*

U.S. Cl. 441—112 **23 Claims**



23. A flotation vest having an outer shell including a back section and left and right front sections joined to the back section at the top and at the sides to form arm holes, and internal buoyancy means carried by the shell and including front portions formed by at least four pieces of buoyancy material when properly fitted edgewise together, form a plurality of quadrilateral pieces such that waste material is minimized in cutting the pieces from rectangular sheets, the front buoyancy portions include a lower body piece and a shoulder piece carried by each of the left and right front sections, each of said body pieces having a lower edge, a central edge, a side edge, and an upper edge, each shoulder piece including a lower edge, an arm hole edge, a neck hole edge, and an upper edge, the shoulder piece lower edge being positioned to engage the body piece upper edge with said engaging edges being formed to engage at an angle such that the arm hole edge and the neck hole edge of the shoulder piece slope at an angle upwardly and outwardly away from the body piece central edge, wherein the width of a shoulder piece between the arm hole and neck hole edges being considerably less than the width of a body piece between its side and central edges a portion of the body piece upper edge forms an arm hole with the arm hole edge of a shoulder piece.

Re. 32,024

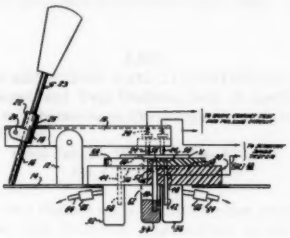
MERCURY PROBE

John H. Greig, Massapequa, N.Y., assignor to MSI Electronics Inc., Woodside, N.Y.

Original No. 4,101,830, dated Jul. 18, 1978, Ser. No. 768,824, Feb. 15, 1977. Application for reissue Jun. 21, 1979, Ser. No. 50,695

Int. Cl.⁴ G01R *1/06, 31/02*

U.S. Cl. 324—158 F **17 Claims**



2. Electrical test apparatus [according to claim 1, wherein], *including means for supporting a test wafer at the face thereof to be tested, the supporting means providing a wafer-engaging face, a reservoir of mercury below said supporting means, means providing a passage from the reservoir through at least part of said supporting means to the wafer-engaging face thereof for enabling the mercury to contact said test face of the wafer, said passage means terminating in an aperture in said wafer-engaging face accurately determining an area of contact of the mercury to a wafer on said wafer-engaging face, said supporting means providing electrical insulation between the wafer and the mercury that contacts the wafer during use of the apparatus except for said determined contact area, means for developing a vacuum in the interface between the wafer-engaging face of said supporting means and the wafer near and at said aperture for drawing mercury from the reservoir to said contact area and for holding the wafer against said wafer-engaging face,* said supporting means [includes] *including* a chuck and a separate orifice plate on the chuck, a surface of said orifice plate providing said wafer-engaging face, said chuck and said orifice plate having aligned bores forming at least part of said passage means from the mercury reservoir to the wafer-engaging face, at least said orifice plate having a bore additional to said aligned bores providing part of said means for developing vacuum in the interface between the wafer-engaging face of said orifice plate and the wafer.

PLANT PATENTS

GRANTED NOVEMBER 5, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,579

ROSE PLANT 'SNOW BRIDE'

Betty J. Jolly, Sea Girt, N.J., and Nelson F. Jolly, Galena, Md., assignors to Jolly's Rosehill Farm of Kent, Inc., Galena, Md.

Filed May 23, 1983, Ser. No. 497,180
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by heavily petaled, relatively large, high centered, near white flowers with yellow-white toned centers borne primarily one to a stem.

5,580

CARNATION NAMED LONTRELOS

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,567
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct spray carnation plant, substantially as herein shown and described, characterized by the very light Orient Pink coloration of its small blooms which are produced profusely on long, straight and strong flowering stems; and by its vigorous and upright growth habit, abundant foliage and resistance to *Fusarium oxysporum.*

PATENTS

GRANTED NOV. 5, 1985

ERRATA

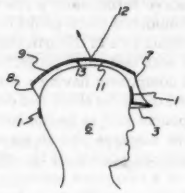
For CLASS	See PATENT NO.
623–001	4,550,447
623–016	4,550,448
623–016	4,550,449
623–018	4,550,450
426–656	4,551,351
250–396	4,551,599

PATENTS

GRANTED NOVEMBER 5, 1985

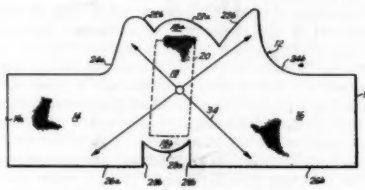
GENERAL AND MECHANICAL

4,550,445
VENTILATED ATHLETIC CAP
David A. Fender, 384 Pheasant Run Rd., Harleysville, Pa. 19438
Filed May 4, 1984, Ser. No. 607,265
Int. Cl.[4] A42C *5/04*
U.S. Cl. 2—181.6 6 Claims



1. A hat or cap comprising:
a headband of pliable, moisture-permeable material with tightness adjusting means;
a visor attached to said headband, said visor being formed from a semi-rigid material and shaped so as to incline downwardly from said headband, and in addition, to extend backwardly in an arcuate manner along each side so as to nearly encircle the head of the wearer;
a canopy of formed cloth elements or other semi-rigid materials attached to the outer edges of said visor, said canopy being formed from a plurality of elements having arcuate edges stitched or otherwise seamed together,
said canopy further comprising a radiation reflecting (light) outer material, and a radiation absorbing (dark) inner material,
and said canopy further having a semi-circular air vent in the front and a similar vent in the rear.

4,550,446
INSERT TYPE FOOTWEAR
Jack Herman, 3 Prince St., Spring Valley, N.Y. 10977
Filed Mar. 31, 1982, Ser. No. 364,010
Int. Cl.[4] A41B *11/00*
U.S. Cl. 2—239 7 Claims

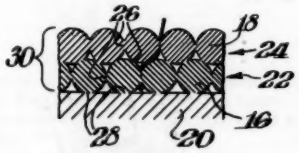


5. A sock-type article adapted to be worn on the foot within shoe-type apparel, comprising an article formed of lightweight flexible material which is waterproof to prevent moisture from entering into the interior thereof through said material, and which is breathable to allow water vapor to pass out from the interior thereof through said material, said article being formed from a one-piece pattern of said material whose edges are joined to each other at at least four seams of which none run adjacent to the sole or heel regions of the foot, and wherein said pattern includes a central region and a pair of side regions, said central region having rearward and forward peripheral edge regions which extend beyond the area to be contiguous to the sole and heel regions of the foot.

4,550,447
VASCULAR GRAFT PROSTHESIS
Louis Seiler, Jr., Huntington Beach, and Robert F. Rosenbluth, Laguna Niguel, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.
Filed Aug. 3, 1983, Ser. No. 520,027
Int. Cl.[4] A61F *1/00*; B29G *7/02*
U.S. Cl. 623—1 9 Claims

1. A flexible, monolithic, polymer tube comprising:
a porous tube wall having a microstructure of interconnected nodes and fibers, and
a generally transverse regular, repeating pattern of external ribs on said wall, said ribs being an integral part of said wall and being less porous than said wall.
2. A vascular graft prosthesis comprising:
a flexible, monolithic, polymer tube, said tube having a wall and a closely spaced, generally transverse regular, repeating pattern of ribs on the external surface of said wall,
said wall, having a microstructure of interconnected nodes and fibers and having a porosity suitable for use as a vascular graft, and
said ribs being an integral part of said wall and being less porous than said wall.

4,550,448
BONE PROSTHESIS WITH POROUS COATING
Robert V. Kenna, Hackensack, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.
Filed Feb. 18, 1985, Ser. No. 350,130
Int. Cl.[4] A61F *1/00, 5/04*
U.S. Cl. 623—16 4 Claims



1. In a bone prosthesis comprising a substrate of a metallic material and a porous coating of said metallic material bonded to and extending over at least a portion of the surface of said substrate, with said porous coating consisting essentially of a multiplicity of spherical particles of said metallic material bonded together at their points of contact, and with said particles defining between themselves a plurality of connected interstitial pores extending through said porous coating to said surface of said substrate,
the improvement wherein said porous coating consists essentially of first and second layers of said particles, with the

particles in said first layer being bonded to said substrate and said first layer being bonded to said second layer, the particles in said first and second layers being distributed upon said substrate and said first layer, respectively, at substantially uniform surface densities and the particles in said first and second layers being of from +30 to −20 U.S. Standard mesh size, and the distribution of said particles in each of said layers is such that, as determined by mercury intrusion porosimetry, the average pore size in said porous coating is from 390 microns to 465 microns, the volume occupied by pores in said coating of up to 200 microns in pore size is no more than 20 percent of the total volume of porosity in said coating, and the volume occupied by pores in said coating of 800 microns or more in pore size is no more than 14 percent of the total volume of porosity in said coating.

4,550,449

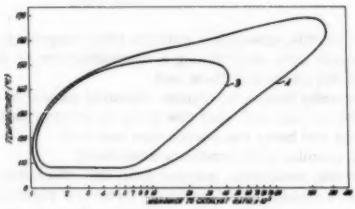
ABSORBABLE BONE FIXATION DEVICE

Deger C. Tunc, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.

Division of Ser. No. 439,962, Nov. 8, 1982. This application Nov. 5, 1984, Ser. No. 668,042

Int. Cl.⁴ A61F *1/00, 5/04*

U.S. Cl. 623—16 **3 Claims**



1. A resorbable bone fixation device capable of maintaining a tensile strength of at least 100 kilograms per square centimeter for 8 weeks after implantation in an animal body made from a poly L(−)lactide polymer having an inherent viscosity as a 1 percent solution in chloroform at 25° C. of from 4.5 to 10 and containing less than 2% of unreacted lactide monomer.

4,550,450

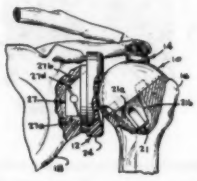
TOTAL SHOULDER PROSTHESIS SYSTEM

James G. Kinnett, 5534 St. Charles Ave., New Orleans, La. 70115

Filed Jul. 24, 1984, Ser. No. 634,482

Int. Cl.⁴ A61F *1/24*

U.S. Cl. 623—18 **23 Claims**



1. A total shoulder replacement prosthesis system for replacement of the articular surface portions of the humerus and glenoid and resurfacing of a portion of the acromion, comprising a humeral prosthesis component having a convex main body portion shaped to provide a complex generally hemispherical head formation defining a generally ovaloid rear face disposed generally perpendicular to a center axis of the component and a convex pseudo-hemispherical articulating front surface extending forwardly from the rear face, the humeral component having a fixation keel projecting integrally from the body portion from the mid region of said rear face for a distance substantially not greater than the maximum depth dimension of the pseudo-hemispherical head formation to be implanted on the proximal humerus portion of a shoulder and having a non-round cross-sectional configuration, a glenoid component formed of a two-part assembly of a rigid member and an articular member of plastic material shaped to provide a shallow concave articular surface to articulate with the front surface of the humeral component and having rounded corners bounding the concave surface and a rearwardly facing well and deflectable shouldered catch projections to nestingly receive a flat confronting face of the articular component in said well and interlock with said catch projections, said base member of the glenoid component having a rearwardly projecting integral fixation keel of similar shape and depth of projection as the humeral component keel to be implanted on the scapular portion adjacent the humerus, and an acromial component to be fixed on a resurfaced portion of the inferior aspect of the acromion formed as a two piece assembly of a rigid backing member and a plastic generally oval shaped facing member having a shallow concave articular front face and a rear face secured against a confronting face of the backing member, interfitting catch formations projecting from one to the other of the acromial component members to interlock them together, and the backing member having fixation projection formation means to be implanted in the resurfaced acromion portion.

4,550,451

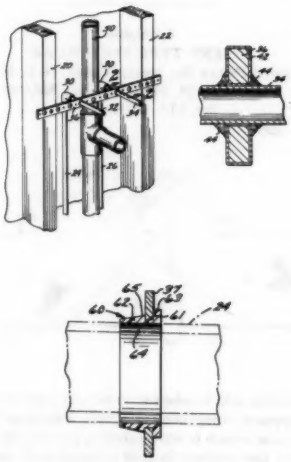
UNIVERSAL PLUMBING PIPE LOCATOR AND SUPPORT

George R. Hubbard, 1855 Rockhoff Rd., Escondido, Calif. 92026

Continuation-in-part of Ser. No. 384,509, Jun. 3, 1982. This application Oct. 7, 1983, Ser. No. 540,007

Int. Cl.⁴ E03C *1/04*

U.S. Cl. 4—192 **17 Claims**



1. In combination with a pair of spaced apart building studs and an associated pair of pipes, an improved universal plumbing pipe locator and support for precisely and rigidly fixing said pipes permanently in position relative to said studs, said improved locator and support comprising:

an elongated supporting strap having upper and lower

edges, and further having a first plurality of longitudinally aligned openings located between said upper and lower edges and extending the full length of said strap, said openings being spaced apart by a predetermined distance wherein said pipes are alignable and in registration therewith, said elongated supporting strap adapted to be dimensioned to a predetermined elongated length, said pipes projecting through a pair of said openings, said strap further having a second plurality of openings extending the full length of said strap;

fastener means extending through said plurality of openings and permanently fastenening said strap to said studs; and

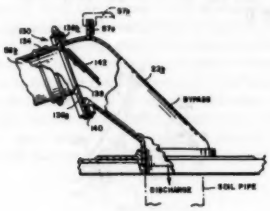
means fixing said pipes within said pair of openings, whereby said pipes are fixed in position in predetermined spaced apart relation for attachment to a pair of plumbing fixture conduits.

4,550,452

TOILET SYSTEM

Wesley M. Tufts, Holliston, Mass., assignor to Control Fluidics, Inc., Greenwich, Conn.

Filed Jan. 30, 1984, Ser. No. 575,072
Int. Cl.⁴ E03D *9/10*
U.S. Cl. 4—319 **3 Claims**



1. A toilet system comprising a toilet bowl having at the bottom a discharge opening, a treating chamber having an intake opening, a conductor connecting the discharge opening of the bowl to the intake opening of the treating chamber, an attrition member in the treating chamber, a discharge pump in the treating chamber for discharging treated effluent therefrom into a waste pipe, said conductor comprising a trap through which effluent is inducted by the discharge pump and a bypass conductor connected at one end to the trap and at its other end to the waste pipe containing a valve held closed by low pressure developed in the treating chamber by the discharge pump which is free to open in the event of a pressure head in the trap and a vent pipe connecting the top of the trap to the bypass conductor, a motor, means drivably connecting the attrition member and discharge pump to the motor for effecting simultaneous operation of the attrition member and the discharge pump, a valve connecting the bowl to a source of water operable to admit water to the bowl and means for sequencing of the valve and the motor to initiate operation of the attrition member and discharge pump, followed by operation of the valve to supply flush water to the bowl, terminate operation of the discharge pump and then close the valve.

4,550,453

COMPACT, PORTABLE DRAIN TO EMPTY AND CLEAN A RECREATIONAL VEHICLE HOLDING TANK

Howard M. Norman, Sacramento, Calif., assignor to Marion E. Norman, Sacramento, Calif., a part interest

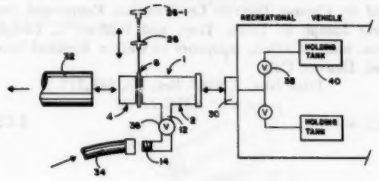
Filed Aug. 2, 1984, Ser. No. 636,968
Int. Cl.⁴ E03D *1/00*
U.S. Cl. 4—323 **8 Claims**

1. A drain to be interfaced with a recreational vehicle to permit the contents of a holding tank from said vehicle to be emptied, said drain comprising:

a hollow drain body defining a flow path communicating with the holding tank and through which the contents of said tank can pass,

flow control means to control the passage of the contents through the flow path of said drain body,

means by which to enable said flow control means to be moved to a first position at the interior of said drain body and across the flow path to block the passage of the holding tank contents therethrough or to a second position at the exterior of said drain body and out of said flow path to permit the passage of the holding tank contents therethrough, and



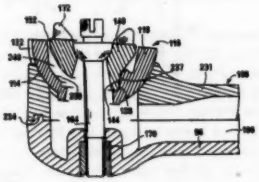
a fluid inlet communicating with said flow path for supplying to the holding tank a fluid for cleaning said tank after the contents thereof have been emptied, said fluid inlet interconnected at one end thereof with said drain body ahead of said flow control means and closer to the recreational vehicle than said control means, and said fluid inlet interconnected at another end thereof with a source of said fluid, said fluid inlet supplying fluid to said holding tank by way of said drain body only when said flow control means is moved to the first position across said flow path.

4,550,454

TOILET-BOWL BIDET APPARATUS

George M. Yui, 1543 Knareswood Dr., Mississauga, Ontario, Canada L5H 2L9

Filed Oct. 18, 1984, Ser. No. 661,976
Claims priority, application Canada, Oct. 18, 1983, 439212
Int. Cl.⁴ A47K *4/00, 3/20;* **E03D** *9/08*
U.S. Cl. 4—420.4 **14 Claims**



1. Bidet-apparatus, having a spray-apparatus, where the spray-apparatus is so disposed as to provide a stream of water directed upwards towards the perineum of a person using the bidet apparatus;

where the spray-apparatus includes a discharge outlet having a substantially continuous annular shape, the outlet being substantially non-adjustable as to its size;

where the spray-apparatus includes, upstream from the annular discharge outlet, a jet-member comprising several small nozzle-holes;

where the jet-member is adjustable to provide a range of volume flow rates from the annular discharge outlet, in that the nozzle-holes are adjustable as to size;

where the spray-apparatus includes a deflector, and where the nozzle-holes are so disposed in the spray-apparatus that water emerging from the nozzle-holes cannot pass

directly through the annular discharge outlet without first impinging against the deflector;

where the annular discharge opening is so dimensioned and arranged that the stream of water that emerges from the annular discharge opening remains as a coherent, coalesced, uninterrupted tube of water, with substantially no side-spray, over a substantial proportion of the said range of volume flow rates.

4,550,455

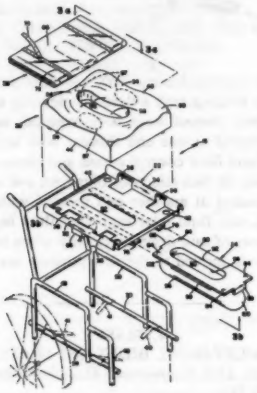
SLOSH DAMPENING WASTE RECEPTACLE FOR CHAIRS FOR CARE OF INCONTINENT PERSONS

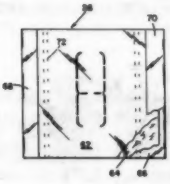
Donald W. Carson, Denver; Lee Penrose, Englewood, both of Colo.; Joseph E. Leich, Troy, and William C. Caugherty, Utica, both of Mich., assignors to Carson Medical Incorporated, Denver, Colo.

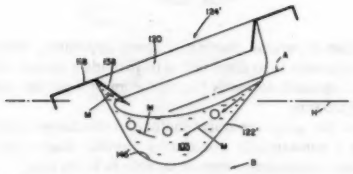
Filed Nov. 2, 1983, Ser. No. 548,227

Int. Cl.⁴ A47K *11/06*

U.S. Cl. 4—480 **5 Claims**







1. A wheelchair for an incontinent disabled person comprises an apertured seat disposed over a receptacle mounted to be removed from said wheelchair,

said seat comprising an upper detachable compliant seat member defining said aperture and an underlying, substantially rigid plate in supporting relationship to and having an elongated aperture corresponding with that of said compliant seat member,

said elongated apertures of said seat member and plate positioned to register with flow from the waste discharge passages of the person permanently seated-thereabove, and with said receptacle therebelow,

said receptacle disposed in waste-receiving relationship to said person being constructed and arranged to hold fluid discharges of said person, the inner surface of said receptacle being specially formed with concave sides to direct laterally-moving fluid waste in said container in a generally upward direction, and means for thereafter directing said fluid downwardly to permit spillage or sloshing due to motion of said chair or the motion of removal of said receptacle for emptying,

said receptacle being removable and replaceable via access means located below the level of the said support plate to enable emptying without disturbing said seated person, said receptacle having upper, sideways-directed portions slideably engaged for support with guides carried by said rigid plate.

4,550,456

INFANT CRADLE ASSEMBLY

James E. Allen, 126 E. Colfax, Palatine, Ill. 60067

Continuation-in-part of Ser. No. 423,992, Sep. 27, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,559

Int. Cl.⁴ A47C *29/00*; A47D *7/00*

U.S. Cl. 5—98 B **10 Claims**

1. An infant cradle assembly comprising

a frame assembly having a plurality of parts capable of being disassembled;

bed means attached to said frame assembly and arranged to hang therefrom to form a bed;

a plurality of support cords being coupled to a plurality of points on said frame assembly and being arranged to be attached to a carrier;

said support cords being formed from a resilient material for inducing a multitude of motions on said frame means and said bed means while attached to a carrier;

said plurality of support cords comprise a pair of support cords having their opposite ends attached to opposed points on said frame means; and

a support sleeve through which an intermediate section of said support cords extend, said support sleeve further including means for attaching said sleeve to a carrier to support said frame assembly and said bed means.

4,550,457

RESTING DEVICE WITH ROTATABLE COVERING ENVELOPE

Hendricus W. A. Dukkers, Oude Entrepot 16, 1018 Ad Amsterdam, Netherlands

Filed May 22, 1984, Ser. No. 612,897

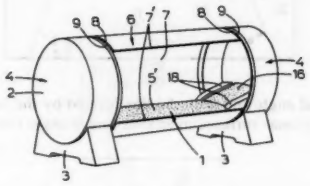
Claims priority, application Netherlands, Jun. 10, 1983, 8302073

Int. Cl.⁴ A47C *29/00*; A47G *9/00*

U.S. Cl. 5—414 **10 Claims**

1. Resting device, comprising an at least partly horizontal lying means extending at a distance above the ground and

connected at its end with uprights, which lying means is provided with an adjustably supported tube-shaped envelope, in which an opening is formed for getting in and out of the device, said envelope comprising on both sides an end ring, which end rings are supported within the uprights by support rollers, wherein the tube-shaped envelope is substantially formed as a circle cylinder which is rotatable about its at least approximately horizontal longitudinal axis, said support rollers having axes of rotation, which are parallel to said longitudinal axis, and wherein the lying means is connected on both sides to a stationary end cylinder, which is supported by a base member



and which is provided with a vertical end wall, each end cylinder forming one of the said uprights, said end cylinders being directed with their open sides towards each other and being coaxial with the intermediate rotatable cylinder, while each support roller is supported by a carrier, which is mounted within one of the base members and which is connected to this base member, the end rings extending over the whole circumference on both sides of the rotatable cylinder, while each end ring is at least partly received in a stationary outer ring with a slight play, each outer ring forming a part of one of the end cylinders and having openings for the support rollers.

4,550,458

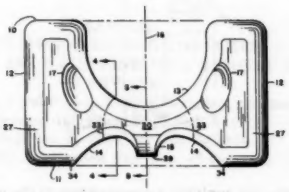
CERVICAL SUPPORT PILLOW

John W. Fiore, 7240 Lem Turner Rd., Jacksonville, Fla. 32208

Filed Nov. 14, 1983, Ser. No. 550,804

Int. Cl.[4] A47C *20/00*

U.S. Cl. 5—434 **19 Claims**



1. A flexible resilient pillow to support the cervical area of one using the pillow, said pillow having a central body terminated by a top edge and a bottom edge generally parallel to each other, a generally semicircular cutout section extending from said top edge into said body and adapted to receive the back of the head of the user, a pair of spaced sectorial cutout sections extending from said bottom edge into said body and adapted to fit over the shoulders of the user, said three cutout sections being generally symmetrical about an axis through said body and perpendicular to said top and bottom edges, said pillow having a narrow portion between said pair of cutout sections and terminating spacedly above and adjacent said bottom edge, said narrow section being pressed against the area of the back adjacent the seventh cervical vertebra of the user, said pillow further comprising a pair of spaced lateral wing portions extending laterally along said bottom edge from respective said pair of cutout sections to the lateral edges of said pillow, said wing portions adapted to extend forwardly of the respective shoulders of a user and thereby to apply anterior pressure onto said narrow portion and to apply a force against the cervical area of the back and the adjacent seventh vertebra restraining the spinal discs of the user from bulging.

4,550,459

ORTHOPEDIC PILLOW

Dieter Endel, Konstanz, and Gerd Billerbeck, Wuppertal, both of Fed. Rep. of Germany, assignors to IBU Betten-Union GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 498,630

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220336

Int. Cl.[4] A47G *9/00*

U.S. Cl. 5—437 **1 Claim**

1. An orthopedic pillow, comprising:

a generally rectangular main pillow portion having a stuffing with generally uniform thickness, this main pillow portion being bounded by an upper edge, a lower edge, and left and right side edges; and

an additional pillow portion having a stuffing with generally uniform thickness. this additional pillow portion being bounded by an upper edge, a lower edge, and left and right edges;

said additional pillow portion being substantially shorter in the direction extending between the upper and lower edges thereof than is said main pillow;

means operatively connecting said additional pillow portion to said main pillow portion so that:

said left edge of said additional pillow portion at least generally coincides with said left edge of said main pillow portion throughout at least part of the extent of each,

said right edge of said additional pillow portion at least generally coincides with said right edge of said main pillow portion throughout at least part of the extent of each,

said upper edge of said additional pillow portion is located substantially down said main pillow portion from said upper edge of said main pillow portion; and

said additional pillow portion, in a region extending substantially fully across the width thereof and throughout at least part of the height thereof in the direction extending between the upper and lower edges thereof is juxtaposed with said main pillow portion in such a manner as to provide a total pillow thickness throughout said region that is substantially greater than said generally uniform thickness of said main pillow portion;

said operatively connecting means comprising sewn seaming and said operatively connecting means leaves said additional pillow portion free of connection to said main pillow portion above the lower edge of said additional pillow portion, at least throughout a medial portion of said region having a substantial width;

said means operatively connecting said additional pillow portion to said main pillow portion additionally leaving said lower edge of said additional pillow portion located up said main pillow portion from said lower edge of said main pillow portion;

said main pillow portion and said additional pillow portion being constituted by respective separate pillows, with the latter being superimposed upon the former; and

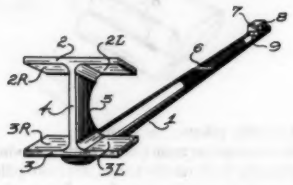
said additional pillow portion including left and right quilt-

ing seams applied through the thickness thereof extending approximately parallel to said left and right side edges thereof intermediate the width thereof bounding respective margins of said medial portion.

4,550,460
AIR BRAKE SLACK ADJUSTMENT AND MEASUREMENT TOOLS

Henry C. Smallbrook, 19255 Baker Rd., Bend, Oreg. 97702, and William E. Spicer, 2271 Key Clr., Sparks, Nev. 89431

Filed Jul. 5, 1983, Ser. No. 510,549
Int. Cl.[4] B25F *11/00*
U.S. Cl. 7—164 **7 Claims**



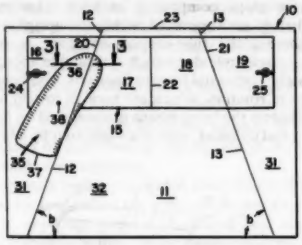
1. An air brake adjustment tool for an air brake assembly including an air brake chamber, a slack adjustment pivotally supported at a first end thereof, and a clevis rod extending from said air brake chamber and pivotally attached at to a second end of said slack adjustment, said tool comprising: adjustment means having a handle portion and a gripper portion attached to said handle portion and adapted to engage said slack adjustment to move said slack adjustment between a braking position and a non-braking position, said gripper portion including a separated pair of jaw members attached to a first end of said handle and adapted to engage opposing edges of said slack adjustment, said jaw members being angled towards each other, said pair of jaw members of said gripper portion including a substantially planar inner jaw member coupled to said first end of said handle and a substantially planar outer jaw member, said gripper portion further comprising a connector member coupling said outer jaw member to said inner jaw member, said connector member being substantially planar and attached to said inner jaw member and said outer jaw member at substantially right angles, said connector member being substantially trapezoidal in shape having two, opposing parallel edges and two, opposing non-parallel edges, and wherein said inner jaw member is attached to a first of said non-parallel edges, and said outer jaw member is attached to a second of said non-parallel edges.

4,550,461
BIPLANE POSTING DEVICE

Kenrick J. Dennis, 376 Orange St., Oakland, Calif. 94610, and Robert A. Cooke, 341 Century Clr., Danville, Calif. 94526

Filed Jan. 23, 1984, Ser. No. 573,281
Int. Cl.[4] A43D *39/00*; A61F *5/14*
U.S. Cl. 12—1 R **9 Claims**

1. A biplane posting device comprising:
a board having a flat upper surface, a front edge and a rear edge and indicia forming a straight line diverging from the rear edge and toward the front edge at a first angle; and
a thin plate overlying said upper surface, said thin plate having a planar portion parallel to said surface and in contact with it and a planar portion diverging from said upper surface at

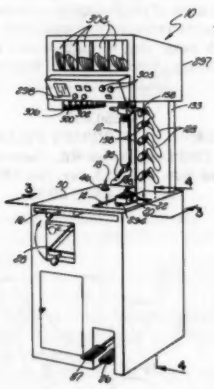


a second angle and with the line formed by the intersection of said planar surfaces overlying said straight line.

4,550,462
SHOE APPARATUS AND METHOD

Donald W. Phillips, Chateau Perigood 1 45 D 6 Laceto St. Leon, Monte Carlo, Monaco

Filed Sep. 30, 1981, Ser. No. 307,249
Int. Cl.[4] A43D *87/00, 89/00, 95/22*
U.S. Cl. 12—17 R **67 Claims**

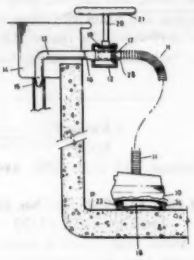


1. Apparatus for applying a wear portion to the underside of a shoe, comprising:
means for receiving a shoe;
means for locating an adhesive-coated wear portion in an initial position relative to the shoe, with the adhesive coating essentially opposite to and spaced from the underside of the shoe, including an actuating element carrying the wear portion and mounted for reciprocal movement toward and away from the shoe receiving means;
means for heating the wear portion in said initial position;
means for applying a first pressure to urge the actuating element and the shoe receiving means toward each other and urge the wear portion and the shoe together, said first pressure means comprising first lever means and means for transmitting tensile forces from the first lever means to the actuating element; and
means for applying a second pressure in situ through the force transmitting means to further urge the wear portion and the underside of the shoe together, the second pressure being greater than the first pressure.

4,550,463
STEERING DEVICE FOR A SUCTION CLEANING APPLIANCE

Johann N. Raubenheimer, Bedfordview, South Africa, assignor to Peacock Investments (Proprietary) Limited, Johannesburg, South Africa

Continuation-in-part of Ser. No. 480,392, Mar. 30, 1983, abandoned. This application May 16, 1984, Ser. No. 610,849
Claims priority, application South Africa, Jun. 16, 1982, 82/4243
Int. Cl.⁴ E04H *3/20*
U.S. Cl. 15—1.7 **3 Claims**

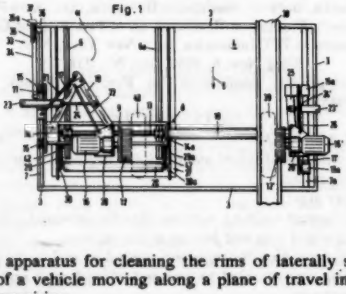


1. A steering device for a suction head for cleaning submerged surfaces which suction head is connected to a suction system by means of the flexible suction hose connecting with the head in a direction substantially normal to the surface to be cleaned and which has drive means which from time to time breaks adhesion of the head to the surface while causing the head to move, which steering device comprises a rotary swivel for interposition between the suction system and the suction hose, the swivel including a first member adapted to be fast with the suction system and the second member adapted to be fast with the suction hose and being rotatable relatively to the first member, and a manually operated device fitted to the second member by means of which the hose end connected to the swivel may be rotated.

4,550,464
DEVICE FOR CLEANING THE WHEELS PARTICULARLY THE RIMS OF A VEHICLE IN A CARWASH

Horst Messing, Lindlar, Fed. Rep. of Germany, assignor to Mr. Wash Auto-Service AG, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 549,854
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241559
Int. Cl.⁴ B60S *3/06*
U.S. Cl. 15—53 B **16 Claims**



1. An apparatus for cleaning the rims of laterally spaced wheels of a vehicle moving along a plane of travel in a car wash, comprising

means comprising a plurality of rotating cleaning brushes for pressing against respective of the rims of said wheels substantially in a direction perpendicular to the direction of travel of said vehicle in a cleaning process,

at least one driver drivable by at least one of said wheels,

a common carriage which is freely movable from a starting position in the direction of travel of said vehicle being operatively connected to said driver,

said plurality of brushes being mounted on said common carriage,

means for restoring said common carriage to said starting position,

said common carriage being actuated for moving along with the vehicle by at least one of said wheels via said at least one driver, the cleaning process commencing during said moving, and said common carriage being released via release of said driver from said at least one wheel at the end of said cleaning process whereupon said means for restoring returns said common carriage to said starting position,

said driver comprises a plurality of swing arms and a driver roller engageable by said at least one wheel for pushing said driver forward along with the movement of the vehicle,

a plurality of guide rails,

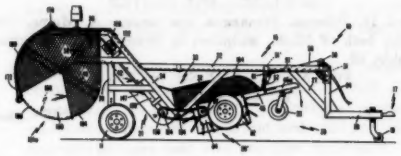
said driver roller being rotatably pivotally connected via said plurality of swing arms to a front portion of said common carriage and being operatively mounted on said plurality of guide rails,

each of said guide rails being bent downwardly at a downwardly bent portion thereof adjacent a portion of the car wash corresponding to the end of the cleaning process so as to cause lowering of said driver roller beneath said plane of travel of the wheels of the vehicle so that said at least one wheel of said vehicle passes over said driver roller releasing the latter and causing said means for restoring to return said common carriage to said starting position.

4,550,465
APPARATUS FOR COLLECTING LITTER AND OBJECTS FROM A GROUND SURFACE

Barney D. Chrisley, 742 Peach St., Abilene, Tex. 79602

Filed Mar. 8, 1983, Ser. No. 473,088
Int. Cl.⁴ E01H *1/00*
U.S. Cl. 15—84 **28 Claims**



1. Apparatus for collecting ground litter, comprising:

(a) a main frame including wheels supporting the frame for movement over the ground;

(b) front and rear rollers, and means for pivotally mounting the rollers to the main frame, each roller being driven in opposite direction to each other and respectively including plurality of fingers projecting outwardly therefrom a sufficient distance to contact the ground and lift objects engaged between adjacent fingers from the ground, said fingers on the front roller rotating upwardly into meshing contact with said fingers on the rear roller so that objects engaged between fingers of the front fingers by the rear fingers and entrapped between the rear fingers for transfer thereto;

(c) wiper means meshing with the front and rear roller fingers for dislodging objects entrapped between the fingers and to augment transfer of said objects towards said rear roller fingers, said wiper means including means

located to engage with the front fingers as the front fingers travel out of contact with the rear fingers to dislodge objects entrapped between the front fingers as the front fingers travel towards their uppermost position, said means being further located to direct said dislodged object onto the rear fingers;

(d) means on the main frame for storing objects lifted by the front and rear rollers; and

(e) means for conveying said objects from the rear roller to the storage means.

4,550,466

CLEANING ELEMENTS FOR INSIDE CLEANING OF THE TUBES OF TUBE-TYPE HEAT EXCHANGERS AND METHOD OF MANUFACTURING SAME

Günther Schmitz, Moers, Fed. Rep. of Germany, assignor to Taprogge Gesellschaft mbH, Düsseldorf, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,665

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218254

Int. Cl.[4] B08B *9/04*

U.S. Cl. 15—104.06 R 10 Claims

1. Cleaning element for cleaning the interior of heat exchanger tubes by being carried along by a cooling water stream and automatically squeezed through the tubes by the cooling water stream, comprising a sphere with a center foamed in a closed mold, said sphere being formed of an open-cell sponge rubber core being condensed toward the surface of said sphere into a gradually denser open-pore water-permeable skin integral with said core.

4,550,467

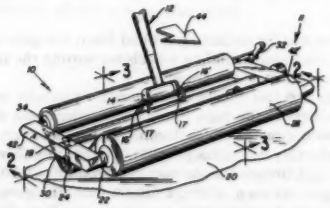
BOWLING LANE DUSTER

Richard H. Johnson, Muskegon, and George A. Muma, Casnovia, both of Mich., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 12, 1982, Ser. No. 357,603

Int. Cl.[4] A47L *13/24*

U.S. Cl. 15—228 15 Claims



1. A lane duster, comprising:

a frame having a pair of spaced apart roller bars;

a center bar on the frame lying parallel to and located between the roller bars, the center bar having a handle pivot-hinged thereto;

pad means carried by the center bar and projecting below the plane of the roller bars, said pad means having a curved, downwardly facing surface and a foam covering on said downwardly facing surface;

one of the roller bars having a roll of cloth fabric wound therearound with the free end of the fabric being threaded below the pad means and onto the other roller bar, said pad means deforming so that the cloth fabric disposed below the pad means is continuously contacting and conforming to a bowling lane surface; and

the frame being pivoted about the line of contact of the pad means with the lane surface to selectively contact the fabric below one or the other of the roller bars with the lane surface to accommodate movement of the duster in opposite directions, said curved, downwardly facing surface maintaining the foam covering in contact with the bowling lane surface as the frame is pivoted and permitting effective lane dusting in each of said opposite directions.

4,550,468

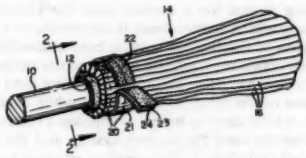
MOP

Marguerite D. Nelson, 415 N.E. 65th Ave., Portland, Oreg. 97213

Filed Oct. 12, 1984, Ser. No. 660,298

Int. Cl.[4] A47L *13/20*

U.S. Cl. 15—229 A 4 Claims



1. A mop comprising:

(a) a handle having opposite ends,

(b) a mop head having a floor cleaning end and an attaching end for attachment to one end of said handle,

(c) said attaching end comprising a wrap-around portion having inner and outer surfaces,

(d) and fabric-type interengaging releasable elements secured on each of said one end of the handle and on said inner surface of the wrap-around portion whereby the latter is arranged to be wrapped around said one end of the handle for engagement of said releasable elements for ready attachment to and detachment from said handle.

4,550,469

WINDSHIELD WIPER ASSEMBLY

Hans-Christian Deutscher, Ludwigsburg; Alfred Kohler; Hans Prohaska, both of Bietigheim-Bissingen, and Karl-Friedrich Schubert, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 6, 1981, Ser. No. 318,739

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045504

Int. Cl.[4] A47L *1/02*

U.S. Cl. 15—250.34 19 Claims

1. A windshield wiper assembly for use with a motor drive unit comprising:

a wiper arm;

an elongated bushing member fixedly mounted relative to said wiper arm and having a central bore;

a shaft extending through and guided in said bore;

a driven unit coupled to one end of said shaft and to said wiper arm;

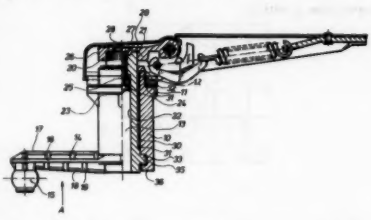
a drive member integrally formed on a portion of the other end of said shaft and extending radially outward there-

from, said drive member being coupled to said motor drive unit;

said shaft and said drive member being formed of plastic material;

said other end portion including a circumferential flange having an upper surface engaging a bottom surface of said bushing;

said bushing including a downwardly extending hook-shaped portion, said hook-shaped portion and said bottom surface cooperatively restraining axial movement of said shaft relative to said bushing;



said flange including a notch, said notch being of such dimensions and positioned on said flange such that said integrally formed drive member and shaft are assembled with said bushing by positioning said notch over said hook-shaped portion, by moving said shaft into said bushing until said flange upper surface engages said bushing bottom surface, and by rotating said integrally formed drive member and shaft relative to said bushing such that said hook-shaped portion engages said flange bottom surface.

4,550,470

COMBINED ROTARY DAMPER DEVICE INCLUDING A STORED ENERGY MECHANISM AND BRAKING MECHANISM

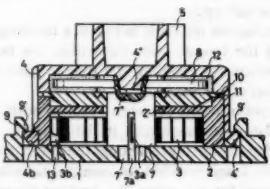
Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed May 29, 1984, Ser. No. 614,604

Claims priority, application Japan, Jun. 1, 1983, 58-95819

Int. Cl.⁴ E05F *5/02*

U.S. Cl. 16—85 **4 Claims**



1. A co-axial rotary damper device, comprising:

a plastic base plate adapted to be fixed to either a main body of a device to be served by said damper device or an opening-closing device used with said device,

a hollow plastic rotary cylinder rotatably disposed on said base plate and rotatable in either a clockwise or a counter-clockwise direction, separate damper plate means non-rotatably fixed relative to said base plate and positioned completely within said rotary cylinder thereby making said rotary cylinder subject to a braking force generated by said damper plate means and a viscous fluid when said rotary cylinder is rotated by a first suitable means activated by an opening or closing motion of said opening-closing device,

a coil spring fastened at one end thereof by a second suitable means to said base plate and connected by a third suitable means at the other end thereof to said rotary cylinder, said spring adapted to be wound and accumulate resilient force by the rotation of said rotary cylinder in one direction,

and a plurality of snap catch fastening means and cooperating shoulder means on said base plate and said rotary cylinder, respectively, to thereby insure rapid coaxial assembly of said rotary damper device.

4,550,471

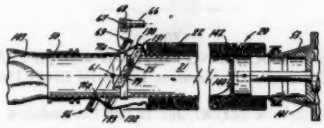
SHIRRED CASING ARTICLE

John H. Beckman, Downers Grove; George C. Haettinger, Lagrange, and Vytautas Kupcikevicius, Chicago, all of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 261,313, May 1, 1981, Pat. No. 4,467,499. This application Jul. 30, 1984, Ser. No. 635,614

Int. Cl.⁴ A22C *13/00*

U.S. Cl. 17—1 R **5 Claims**



1. A shirred casing article comprising:

a. a disposable tubular support including means for releasably mounting said support on a stuffing machine such that the product to be stuffed passes through said tubular support;

b. a shirred and compacted casing supply on said tubular support, said supply having an unshirred portion extendable forward over an end of said tubular support;

c. casing holdback means fixed on said tubular support adjacent said end and disposable within said unshirred portion, and said holdback means including a rigid member adapted to contact against the inner surface of said unshirred portion;

d. said member being movable with respect to said tubular support while within said unshirred portion between at least two positions for altering the contact between said member and said unshirred portion and for producing thereby casing holdback forces of at least two magnitudes; and

e. said member having a portion adapted for cooperative engagement with a stuffing machine control element pressable against the outside of said unshirred portion, and said member disposed within said unshirred portion being movable between said two positions responsive to said cooperative engagement.

4,550,472

APPARATUS FOR AND METHOD OF SHIRRING A TUBULAR CASING

Stephen Temple; Nigel J. Jones, and Alan N. Syrop, all of Cambridge, England, assignors to Devro, Inc., Somerville, N.J.

Filed Mar. 22, 1985, Ser. No. 714,772

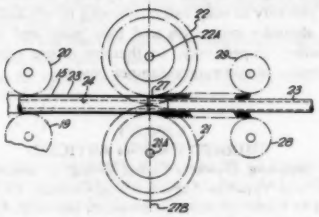
Claims priority, application United Kingdom, Mar. 30, 1984, 8408329

Int. Cl.⁴ A22C *13/02*

U.S. Cl. 17—1 R **13 Claims**

1. An apparatus for shirring a tubular casing comprising a mandrel along which an inflated casing is arranged to be fed, the mandrel comprising a cylindrical section having a uniform diameter followed, in the direction in which the casing is to be fed, by a section which tapers in the direction of casing feeding from the uniform diameter of the cylindrical section to a

smaller diameter, shirring means mounted at said tapered section for shirring said casing over said tapered section to reduce



the inner diameter of the shirred casing to less than the uniform diameter of said cylindrical section.

4,550,473

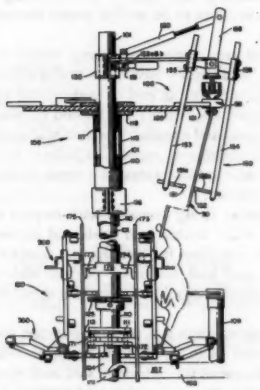
POULTRY PROCESSING METHOD AND APPARATUS

Lacy W. Simmons, 101 Simmons Industrial Blvd., Dallas, Ga. 30132

Division of Ser. No. 284,087, Jul. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 873,370, Jan. 30, 1978, abandoned. This application Jul. 27, 1983, Ser. No. 517,811

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—11 **9 Claims**



1. Processing apparatus adapted to be selectively engaged and driven by a moving processing line carrying successive objects to be processed, comprising:

(a) frame means supported for selective adjustment toward and away from a moving processing line;

(b) processing apparatus supported on said frame means, said processing apparatus including means for performing a processing operation on objects moving along said processing line;

(c) drive means on said frame means supported for selective engagement with said moving processing line, said drive means operable for effecting operation of said processing apparatus;

(d) adjustment means operatively connecting said frame means and said processing line, said adjustment means being operable for moving said drive means between operable and inoperable positions into and out of engagement with said moving processing line; and

(e) adjustably supported guide means for guiding and holding objects to be processed in engagement with said processing apparatus when in an operable adjusted position and for guiding and holding objects to be processed out of engagement with said processing apparatus when in an inoperable position, wherein said guide means includes linkage support means operatively connected to said frame adjustment means whereby said guide means is automatically moved to said operable object guiding position in response to movement of said frame means into said operable line engaging drive position and is automatically moved to said inoperable object guiding position in response to movement of said frame means to said displaced inoperable position.

4,550,474

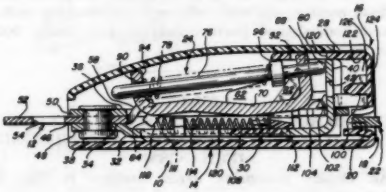
SAFETY BELT BUCKLE

Gerald A. Doty, Crown Point, and William E. Hunter, Jr., Highland, both of Ind., assignors to Gateway Industries, Inc., Hazel Crest, Ill.

Filed Nov. 21, 1983, Ser. No. 553,763

Int. Cl.[4] A44B *11/26*

U.S. Cl. 24—633 **10 Claims**



1. A safety belt buckle for retaining a tongue plate tip within its interior, the buckle comprising:

a frame means having an open forward end for receiving the tongue plate tip and an opposite rearward end for attachment to a belt end;

a latch mechanism movable between a latching position for retaining the tongue plate tip within the buckle and an open position for enabling the tongue plate tip to travel into or out of the buckle;

locking means movable between a locked position for securing the latch mechanism in its latching position and an unlocked position for enabling the latch mechanism to shift from closed position to open position; and

a push button for actuating the locking means from said locked position to said unlocked position to allow release of the tongue plate tip;

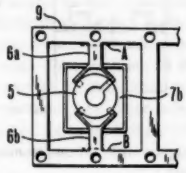
the latch mechanism comprising a pivoting latch plate having guide means thereon for guiding and supporting the locking means;

the locking means comprising an elongated locking member extending in a fore and aft direction and slidably mounted on the guide means on the latch plate, said locking member having a free end for sliding forwardly and rearwardly along the latch plate while the latch plate swings to bring the free end end of the locking member into and from locking engagement with the frame means, and spring means for automatically urging the locking member toward the locked position when the latch mechanism is in its latching position.

4,550,475
QUARTZ UNIT

Sumiyuki Ishigami, and Mitsuru Sato, both of Tokyo, Japan, assignors to Tokyo Denpa Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Goto Seisakusho, Kanagawa, both of, Japan

Division of Ser. No. 417,451, Sep. 13, 1982, Pat. No. 4,486,681.
This application Jan. 3, 1984, Ser. No. 567,541
Claims priority, application Japan, Sep. 21, 1981, 56-150036
Int. Cl.[4] H01L *41/22*
U.S. Cl. 29—25.35 10 Claims



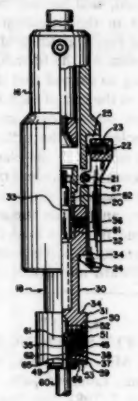
1. A method of forming a quartz unit comprising the steps of forming flexible Y-shaped fittings from a piece of thin metal plate with the Y-shaped fittings comprising a common stem and a pair of branch parts each extending at an acute angle outwardly from one end of the stem with a support part on each of said branch parts at a location spaced from the connection of the branch part to the stem and with the support part bent out of the plane of the branch part approximately perpendicular relative to the branch part, arranging a pair of Y-shaped fittings with all of the support parts in a common plane and with the branch parts of one fitting extending generally toward the branch parts of the other fitting and the stems extending away from one another in opposite directions, placing a quartz vibrator on the support parts located in the common plane, and then bonding the quartz vibrator to the support parts, after the bonding step enclosing the quartz vibrator and at least the branch parts and support parts of the Y-shaped fittings within a pair of container parts having contacting surfaces, and next securing the contacting surfaces of the container parts together in a sealed and airtight manner.

4,550,476
ADJUSTMENT MEANS FOR A DRIVER BIT

Charles J. DeCaro, Charlotte, N.C., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 466,637, Feb. 18, 1983, Pat. No. 4,491,443. This application Jan. 12, 1984, Ser. No. 570,280
Int. Cl.[4] B23B *45/00;* B25F *1/10*
U.S. Cl. 29—26 A 7 Claims

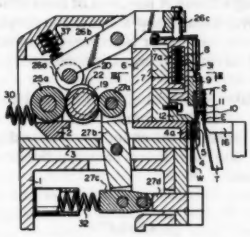
1. In an adapter for a torquing tool including an elongated body having a bore in at least one end to accommodate a working member and a coupling means for detachably attaching the body to the tool, the improvement comprising a depth adjustment bushing threadably engaged within said bore, said bushing including an externally threaded shank for engagement with said bore, an axial passageway through said shank, an axial slot extending through said shank in communication with said passageway and a hollow body section forward of said shank and a screw threadably engaged in a radial opening through the body into the bore whereby said working member is housed within said hollow body section and extends into said passageway, said bushing being rotatable so as to align the slot and the radial opening so that the screw can be tightened into engagement with the working member through said slot.



4,550,477
APPARATUS FOR FORMING AND PLANTING SLIDE FASTENER ELEMENTS

Kenichiro Iai, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 296,822, Aug. 27, 1981, abandoned.
This application Dec. 30, 1983, Ser. No. 566,997
Claims priority, application Japan, Sep. 25, 1980, 55-133478
Int. Cl.[4] B21D *53/56*
U.S. Cl. 29—33.2 3 Claims



1. A high speed apparatus for forming and planting slide fastener elements comprising: a first ram mounted on a frame for reciprocal movement and having at the forward end thereof a cutting die provided with a passage for a wire to be used for fastener elements extending therethrough and a forming die for forming an engageable head in each element; a cutting punch placed on the upper surface of the first ram for relative movement between the cutting punch and the first ram so that the cutting punch cuts out each element having at least one outwardly extending leg from the wire as the first ram moves backward; a forming punch for forming the engageable head placed above the first ram so that it aligns with the forming die when the first ram is at the end of its backward movement; and a side punch means for engaging the at least one leg of each element and deforming it inward for planting the fastener element on a fastener tape, characterized in that the apparatus includes an output drive shaft having first ram drive cam means, forming punch drive cam means and side punch

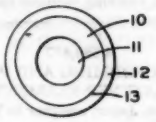
drive cam means; cam follower mechanisms connecting said cam means to the first ram, the forming punch and the side punch means, respectively; a second ram to which said forming punch is connected, said second ram being mounted for reciprocal movement in the direction perpendicular to the movement of the first ram and adapted to be actuated by the cam follower mechanism for the forming punch, said first ram drive cam means being so shaped that the first ram dwells for a predetermined time at the end of each forward and backward movement, the shapes of said cam means and their mutual relation being so selected that the side punch means engages and holds the at least one leg of the element during the dwell at the end of the backward movement of said first ram, begins deformation of the at least one leg during the forward movement of said first ram, and plants the at least one leg on the fastener tape when said first ram is at the end of its forward movement and the forming punch is actuated during the dwell at the end of the backward movement of said first ram.

4,550,478

TWO-PLY SPINNING COTS

Robert S. Olcott, Jr., Millersville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 4, 1981, Ser. No. 290,013
Int. Cl.⁴ B21B *27/02*
U.S. Cl. 29—130 **4 Claims**



1. A two-ply spinning cot for mounting on an arbor of a spinning frame said cot comprising:

an inner layer comprising a resilient rubber composition, said inner layer having a hole disposed approximately axially through the center thereof to receive said arbor and having a Shore A hardness of from about 50 to 70, and

an outer layer comprising a butadiene-acrylonitrile rubber composition, said outer layer being bonded to said inner layer and having a Shore A hardness of from about 70 to 85,

said inner layer comprising from about ⅓ to ½ of the total thickness of said inner and outer layers, and said outer layer comprising from about ½ to ⅔ of said total thickness, said inner and outer layers having different Shore A hardness values.

4,550,479

PROCESS FOR THE PRODUCTION OF A HEAT TREATED BEARING RING

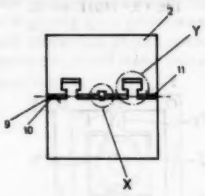
Lothar Walter, Schweinfurt, and Walter Reith, Bad Bocklet, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 467,190
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206126
Int. Cl.⁴ B21D *53/12*
U.S. Cl. 29—148.4 C **3 Claims**

1. A process for production of a heat treated bearing ring with a least one longitudinal slit extending axially therethrough, said slit being formed between two opposing ends facing one another in the circumferential direction, comprising:

stamping one or more flat band sections of a heat treatable strip material with at least one holding tongue and at least one fastening tongue extended on at least one opposing end, and at least one holding recess and at least one fastening recess on the opposite end, each holding and fastening recess having a shape substantially the same as the holding and fastening tongue, respectively, then

bending the band section to form a bearing ring with engagement of the tongues of the one opposing end in respective recesses of the opposite end along the longitudinal slit, the holding tongues and holding recesses engaging with a tight fit without play therebetween, said fastening tongues



and recesses engaging with circumferential and axial play therebetween, then

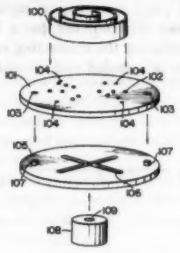
heat treating the bearing ring, said at least one fastening tongue and recess remaining engaged with said play therebetween during said heat treating, and then breaking off the at least one holding tongue of the bearing ring and releasing said tongue from its respective holding recess.

4,550,480

METHOD OF PRODUCING SCROLL TYPE COMPRESSOR

Minoru Tanikawa, Shimizu; Yutaka Imaizumi, Yaizu; Masami Suzuki, Shizuoka; Kazumi Aiba, Shimizu; Minoru Sato, Shimizu, and Mineo Takahashi, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 25, 1983, Ser. No. 497,868
Claims priority, application Japan, May 31, 1982, 57-91235
Int. Cl.⁴ B23P *15/00*
U.S. Cl. 29—156.4 R **3 Claims**



1. A method of producing an orbital scroll member of a scroll type compressor, with the compressor including the orbital scroll member and a stationary scroll member each having an end plate and a spiral wrap protruding upright from said end plate, said spiral wrap of the stationary scroll member being of substantially the same spiral shape as that of the spiral wrap of the orbital scroll member and being engaged by the spiral wrap of the orbital scroll member, the method comprising the steps of:

forming a spiral wrap for the orbital scroll member by cutting a strip of a length and breadth matching a desired spiral wrap and bending said strip in the spiral shape of the desired spiral wrap;

providing an upper half part of an end plate for the orbital scroll member;

forming by plastic working, on a surface of said upper half part, a plurality of projections constituting a discontinuous protrusion extending spirally substantially in conformity

with the spiral form of the spiral wrap, forming a plurality of through holes for oil at portions of said upper half part which are to contact with a flange of the end plate for the stationary scroll member, and forming a plurality of locating holes through said upper half part near the outer periphery thereof;

placing said spiral wrap on said discontinuous protrusion of the upper half part and fixing said spiral wrap to said upper half part by resistance welding;

providing a lower half part of said end plate having the same external size as that of said upper half part;

forming by plastic working, in a surface of said lower half part adapted to contact with said upper half part, grooved oil passage means for permitting all of said oil holes of the upper half part to communicate with each other, and forming projections in a shape adapted to fit into said locating holes of the upper half part on said surface of said lower half part at positions corresponding to those of said locating holes;

securing uniting together said upper half part and said lower half part by fitting said projections of the lower half part into said locating holes of the upper half part;

providing a bearing boss formed with a bearing metal receiving bore adapted to communicate with said oil passage means of the lower half part; and

fixing said bearing boss to said lower half part of the end plate by welding and fitting a bearing metal into said bearing metal receiving bore in such a manner that said bearing metal receiving bore is held in communication with said grooved oil passage means of the lower half part.

3. A method of producing a stationary scroll member of a scroll type compressor, the compressor including an orbital scroll member and the stationary scroll member each having an end plate and a spiral wrap protruding upright from said end plate, said spiral wrap of the stationary scroll member being of substantially the same spiral shape as that of the spiral wrap of the orbital scroll member and being engaged by the spiral wrap of the orbital scroll member, the method comprising the steps of:

forming a spiral wrap for the stationary scroll member by cutting a strip of a length and breadth matching those of a desired spiral wrap and bending said strip in the spiral shape of the desired spiral wrap;

forming an end plate for the stationary scroll member by punching a sheet blank, and forming a flange from the remaining sheet blank after the punching of said end plate;

forming by plastic working, on a surface of said end plate, a plurality of projections constituting a discontinuous protrusion extending spirally substantially in conformity with the spiral form of said spiral wrap;

placing said spiral wrap on said discontinuous protrusion of the end plate and fixing said spiral wrap to said end plate by resistance welding;

providing a sleeve for the stationary scroll member having a stepped portion formed in a bore thereof at one end of the sleeve for receiving said end plate and another stepped portion formed at an outer peripheray of said sleeve at the other end thereof for receiving said flange constituting a surface adapted to contact with the end plate of said orbital scroll member;

fixing said end plate to said sleeve by brazing with said end plate fitted into said stepped portion at one end of the sleeve; and

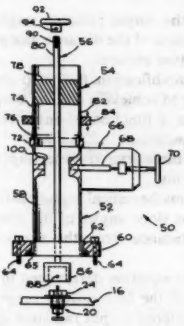
fixing said flange to said sleeve by brazing said another stepped portion of the sleeve fitted into the punched bore of the flange.

4,550,481

ELEMENT REMOVAL TOOL FOR SYSTEM CARRYING FLUID UNDER PRESSURE

Stephen W. Preston, 393 W. Marigold St., Altadena, Calif. 91001

Filed Dec. 27, 1983, Ser. No. 565,636
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—213 R **5 Claims**



1. A tool for replacing an axle box in a member such as a meter, or the like, in a gas distribution system carrying gas under pressure, said member, having, a flat surface carrying said axle box, said flat surface having threaded openings proximate to the periphery thereof;

a base sealing portion including a first pipe having first and second ends, said first end carrying threads and said second end carrying a flange;

said flange on said second end of said first pipe having openings therein for passing threaded bolts therethrough, said flat surface of said member having corresponding threaded openings for receiving said bolts and securing said flange directly to said member;

a gate valve included in said base sealing portion intermediate its first and second ends for controlling the flow of gas through said first pipe;

a stuffing box portion having a second pipe with first and second ends, said first end of said second pipe carrying threads sized and pitched to cooperate with said threads carried by said first end of said first pipe;

said stuffing box portion including a bleed-hole in the wall of said second pipe;

stuffing means carried in said second pipe between said bleed-hole and said second end of said second pipe, said stuffing means having an axial opening therethrough;

closing means for selectively closing said bleed-hole; and,

an element-removal portion including a shaft, a handle removably attached to said shaft at one end and a socket coaxially affixed to said shaft at its other end, said shaft being sized to hermetically seal said axial opening in said stuffing means, said socket being sized to firmly engage said element to be removed.

4,550,482

METHOD OF CONSTRUCTING A BEAM SPREAD LENS

Galen L. Buckley, Irvine, and Paul L. Fox, Whittier, both of Calif., assignors to Pyramid Optical, Inc., Irvine, Calif.

Filed Dec. 22, 1983, Ser. No. 564,566
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—412 **1 Claim**

1. A method of constructing a lens of the type receiving a collimated beam of input radiation for transmitting a narrow sheet of output radiation of substantially uniform intensity over an angular range of approximately + and −45 degrees relative to the input radiation beam, the lens being constructed from an

optically transmissive material having an index of refraction no greater than 1.6; the method comprising the following steps:

a. selecting the number of lens surfaces that will be required to affect the incoming radiation beam for a given transmissive material,

b. providing each surface selected in step a. with lenticulations comprising alternating convex and concave elements having mathematically simple contours such as circular arcs,

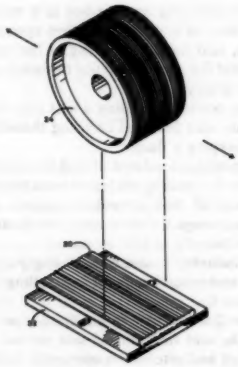
c. determining the output radiation angles of incident beam rays as a function of the distance along the exiting surface of a lenticulation element,

d. applying a modification factor to the output radiation angle spacing to achieve a desired output radiation intensity pattern as a function of angle relative to the input radiation beam,

e. determining the curve representing the altered output radiation spacing,

f. deriving the mathematical equation of the curve of the tangents of the slope angles of the lens surface as a function of the distance from the axis of the lenticulation elements,

g. integrating the equation determined in step f. to generate the equation of the lens surface element contour which provides the altered output radiation spacing,



h. repeating steps c. through g. for each additional lens surface element contour which must be also altered to achieve the desired output radiation pattern for the entire lens, and

i. defining the entire lens geometry in accordance with the results of steps a. through h.,

j. constructing a generating wheel for each surface selected in step a., each such wheel having a contour approximately equal to the obverse of the geometry for the corresponding surface as defined in step i.,

k. generating rough lenticulated surfaces on a plate of said transmissive material by rotating said generating wheels while each such wheel is in compressive linearly reciprocating engagement with the corresponding surface,

l. constructing a grinding fixture for each surface selected in step a., each such fixture having a contour approximately equal to the obverse of the geometry for the corresponding surface as defined in step i.,

m. grinding the respective surfaces of said plate of transmissive material with the corresponding grinding fixture while each such fixture is in compressive linearly reciprocating engagement with the corresponding surface,

n. polishing each of said surfaces, and

o. cutting said plate into a plurality of lenses.

4,550,483

METHOD OF MANUFACTURING A STRUCTURE WITH A FIXED AND A MOVABLE PART PROVIDED WITH OPTICAL FIBRES

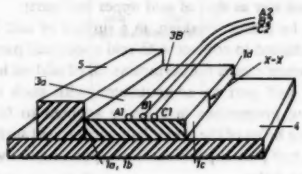
Lars P. Ingre, Huddinge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 9, 1983, Ser. No. 502,693

Claims priority, application Sweden, Jul. 1, 1982, 8204086

Int. Cl.⁴ B23P *17/00*

U.S. Cl. 29—416 **3 Claims**



1. A method of manufacturing a structure including fixed and movable parts provided with optical fibres included in an optical fibre relay in which an optical switching function is performed by moving the movable part from an aligned rest position and relative to the fixed part in a direction at right angles to the axial direction of the fibres to a coupling position, said fibres (A1-A2, B1-B2, C1-C2) being fixed in mutually parallel relation and with a given spacing (δ) on a common carrier (1), said method comprising separating the carrier and the fibres along a cut at right angles to the axial direction of the fibres to form the fixed part and the movable part (3*a* and 3*b*) such that mutually conforming fibre end surfaces are formed and mounting said parts for relative movement such that said end surfaces of said fibres are mutually opposing in said rest position after said cut, and upon a returning of the movable part to said rest position after the same has been moved to said coupling position, the fibre end surfaces are again in mutually opposing relation and in substantially the same position.

4,550,484

METHOD OF MAKING BRAKE SYSTEM ASSEMBLY FOR RAILWAY VEHICLE

Julien C. Mathieu, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

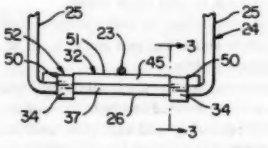
Division of Ser. No. 286,139, Jul. 23, 1981, Pat. No. 4,452,345.

This application Jun. 4, 1984, Ser. No. 617,045

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—434 **3 Claims**



1. In a method of making a brake system for a railway vehicle comprising the steps of, providing a brake rod member, fastening a support structure for said brake rod member on said vehicle, said support having a horizontally disposed supporting member which is adapted to support said rod member for sliding movements thereon, providing an antifriction component made primarily of an ultra high molecular weight polymeric material, and attaching said component on one of said members, said component serving to minimize wear and enable

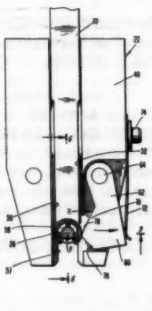
antifriction movements during said sliding movements, the improvement in which said step of providing said component comprises providing a solid elongated strip portion of substantially rectangular cross-sectional configuration, providing a cut-out slot extending inwardly from a top surface of said elongated strip, and said attaching step comprises providing self-contained U-shaped clip means and locking said strip portion against said supporting member with said self-contained U-shaped clip means and locking said strip portion against said supporting member with said self-contained U-shaped clip means, said clip means comprising a pair of resilient parallel legs and a locking projection extending from the outer end portion of each parallel leg toward the other parallel leg, said clip means being disposed during said locking step with said parallel legs embracing opposed vertical surfaces of said supporting member and with said projections snap locked beneath a bottom surface thereof, and said U-shaped clip has the bight thereof disposed in nested relation within said slot.

4,550,485

METHODS AND APPARATUS FOR INSTALLING A RADIALLY APPLIED RETAINING RING INTO AN EXTERNAL GROOVE OF A WORKPIECE

Edmund F. Killian, Merrick, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,559
Int. Cl.[4] B23P *11/02, 19/04*
U.S. Cl. 29—450 **20 Claims**



19. A method of installing a retaining ring into a grooved workpiece comprising the steps of:

positioning said workpiece within a forwardly open slot of a base plate of an applicator such that a movable locator on said base plate projects into a groove of said workpiece,

retaining said workpiece against side surfaces of said slot which are spaced apart by a distance corresponding to a non-grooved diameter of said workpiece, so that said workpiece does not skew relative to said slot,

positioning a retaining ring within a channel aligned with said slot such that a split side of said ring faces said workpiece, and

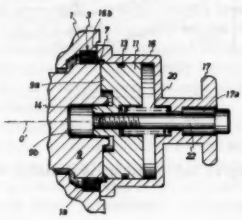
sliding a pusher forwardly within said channel and relative to said base plate to push said retaining ring forwardly into engagement with a cam surface of said locator to cam the latter out of said groove against a spring bias as said retaining ring enters said groove.

4,550,486

METHOD AND APPARATUS FOR MOUNTING OIL SEAL IN MACHINE HOUSING

Kenichi Yarimizu, Fukushima, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 567,979
Claims priority, application Japan, Jan. 24, 1983, 58-8923[U]
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—451 **10 Claims**



10. A method of ensuring the correct mounting of an unidirectional oil seal in a machine housing comprising biasing a hub member to extend outwardly beyond the end of a cylinder in which said hub member is slidable with a biasing force which is greater than the resistance encountered when said oil seal is fitted onto said hub member in a first orientation in which one side of said oil seal faces said cylinder, fitting said oil seal onto said hub member in said first orientation as said spring means urges extension of said hub member outwardly of said cylinder, transferring said oil seal from said hub member onto said machine housing such that the oil seal is thereby mounted in said machine housing in the ensured correct orientation as determined by the fact that the oil seal is capable of being fitted onto said hub member, attempting to fit an oil seal member onto said hub member in a second orientation in which the other side of said oil seal faces said cylinder, precluding fitting of said seal member onto said hub member by biasing said hub member with a biasing force which is less than the resistance encountered when said oil seal is attempted to be fitted onto said hub member in said second orientation, indicating that said second orientation is the incorrect orientation by the fact that the oil seal is incapable of being fitted onto said hub member, and reversing the disposition of the oil seal from said second orientation to said first orientation so that said oil seal is thereby capable of being fitted onto said hub member and subsequently transferred into and correctly assembled in said machine housing in the ensured correct orientation.

4,550,487

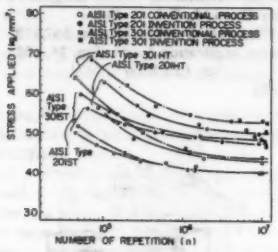
PROCESS FOR PREPARING STRIPS OR SHEETS OF HIGH STRENGTH AUSTENITIC STEEL HAVING IMPROVED FATIGUE STRENGTH

Kazuo Hoshino; Teruo Tanaka, and Kenjiro Ito, all of Yamaguchi, Japan, assignors to Nisshin Steel Company, Ltd., Japan

Filed Sep. 28, 1982, Ser. No. 425,621
Claims priority, application Japan, Oct. 21, 1981, 56-167059
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—527.7 **1 Claim**

1. In the process for preparing cold-rolled strips or sheets of metastable austenitic stainless steel for use in the manufacture of rolling stock subject to high frequency vibrations comprising the known steps of casting a melt of the steel, producing a hot strip therefrom, annealing and pickling said hot strip, cold-rolling the hot-rolled strip, wherein pickling and annealing are properly performed, and finally temper-rolling the obtained

sheets, an improved process for producing steel sheets with improved fatigue resistance characterized in that the mechani-


AISI Type 201 CONVENTIONAL PROCESS
AISI Type 201 INVENTION PROCESS
AISI Type 301 CONVENTIONAL PROCESS
AISI Type 301 INVENTION PROCESS
AISI Type 301 HT
AISI Type 201HT
AISI Type 301ST
AISI Type 201ST
STRESS APPLIED (kg/mm²)
NUMBER OF REPETITION (n)

cal polishing step of belt polishing is included before temper-rolling.

4,550,488

GANG HEAD TYPE MACHINE TOOL

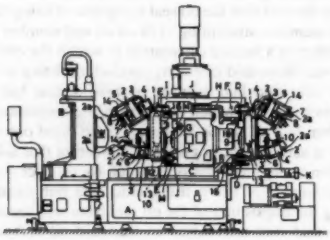
Takeshi Okubo, Sayama; Hideo Kodachi, Kodaira, and Masaki Miyanaka, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,236

Claims priority, application Japan, Dec. 12, 1981, 56-199484; Feb. 15, 1982, 57-21079

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **5 Claims**



1. A gang head means for a replaceable gang head type machine tool, said machine tool including a base, a jig table, driving means mounted on said base and movable to advance and retract with respect to said jig table, means for advancing and retracting said driving means, and annular rail means surrounding said driving means and holding plural gang head means, said annular rail means having a rear stationary rail and a movable front rail, said movable rail movable to advance and retract with respect to said jig table along the same direction as said driving means, each said gang head means comprising base frame means mounted on said movable rail, a working unit mounted on said base frame means and having at least one tool thereon, said driving means being provided for driving the gang head means which is on said movable rail, wherein said working unit is inclined at an angle, other than a right angle, with respect to the direction of advance and retraction of said movable rail, an oil pressure motor mounted on said working unit operatively driving said at least one tool independently of said driving means, and an oil pressure operated cylinder, said oil pressure cylinder being operatively coupled to said working unit for advancing and retracting said working unit with respect to said jig table independently of movement of said driving means.

4,550,489

HETEROJUNCTION SEMICONDUCTOR

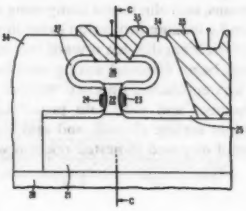
Barbara A. Chappell; Terry I. Chappell, both of Amawalk, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 324,240, Nov. 23, 1981, Pat. No. 4,460,910.

This application Dec. 1, 1983, Ser. No. 557,015

Int. Cl.⁴ H01L *29/80, 29/48, 29/161, 29/06*

U.S. Cl. 29—571 **10 Claims**



1. In the manufacture of individual and functional groups of semiconductor devices, the improvement comprising the steps of:

providing a monocrystalline semiconductor body having lower first and an upper third external semiconductor layer, each forming a semiconductor carrier responsive heterojunction with a second central semiconductor layer, the thickness of said second central layer being of the order of the carrier transport distance of the semiconductor device being manufactured,

removing for each device a portion of said upper and said central layers on each side of a web,

removing for each web a portion of said upper layer at one end of said web,

photoetching said web to a specific transverse dimension, and

applying metal electrical contacts to at least one side of said web and to each of said external semiconductor layers in the vicinity of each said web.

4,550,490

MONOLITHIC INTEGRATED CIRCUIT

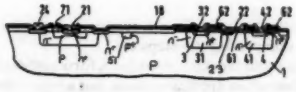
Lothar Blossfeld, Freiburg-Hochdorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 13, 1984, Ser. No. 599,946

Claims priority, application European Pat. Off., Apr. 18, 1983, 83103719.7

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 29—571 **4 Claims**



1. A method of producing a monolithic integrated circuit comprising at least one integrated insulated-gate field-effect transistor whose drain zone and whose source zone of a second conductivity type are introduced into one surface of a semiconducting substrate of a first conductivity type, with at least one of said source or drain zones being surrounded by a partial zone of said second conductivity type which is doped weaker than said source or drain zones, said method comprising the steps of:

(a) forming a first ion masking layer on said substrate surface, with the aid of a first photoresist mask, said ion masking layer having openings over at least one partial

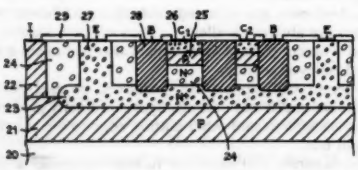
zone area of said partial zones or the partial zone to provide non-covered portions of said substrate surface;
(b) implanting into said non-covered portions of the substrate surface ions of said second conductivity type in a dose corresponding to the doping of said partial zones;
(c) removing said first ion masking layer;
(d) annealing said substrate;
(e) producing an oxidation masking layer by employing a second photoresist mask, said oxidation masking layer covering the entire area of said field-effect transistor including the pn junction areas of the produced partial zones or partial zone only, said oxidation masking layer including at least a lower partial layer adjoining said substrate surface and an upper partial layer, said lower and upper partial layers being selectively etchable, and of which at least the lower partial layer is capable of being used as a gate insulating layer;
(f) oxidizing the unmasked portions of said substrate surface by forming an oxide layer;
(g) depositing a third photoresist mask;
(h) using said third photoresist mask as an etching mask, to expose a first zone area within a first one of said partial zone areas and/or a second zone area within a second one of said partial zone area of said substrate surface;
(i) employing said third photoresist mask as an implantation mask and implanting ions of said second conductivity type in a dose corresponding to the doping of said zones into the already implanted areas;
(j) removing said third photoresist mask;
(k) covering the surface of the arrangement including the oxide layer and the masking layer with a foreign oxide layer;
(l) activating the dopings by annealing;
(m) depositing a fourth photoresist mask comprising openings extending to said zones at predetermined distances in relation to the rim portions thereof, and to the portion of said oxidation masking layer lying above the gate area;
(n) removing the foreign-oxide layer within the openings of the fourth photoresist mask by etching selectively down to said upper partial layer or down to said lower partial layer and, within said zone area of said zone areas down to the said zones for the purpose of forming contact openings;
(o) depositing a conductive layer;
(p) depositing a fifth photoresist mask; and
(q) utilizing said fifth photoresist mask for etching at least electrodes out of said conductive layer.

4,550,491

METHOD OF MAKING SUBSTRATE INJECTION LOGIC OPERATOR STRUCTURE

Maurice Depey, Paris, France, assignor to Thomson CSF, Paris, France

Continuation of Ser. No. 261,935, May 8, 1981, abandoned. This application Dec. 3, 1984, Ser. No. 677,885
Claims priority, application France, May 12, 1980, 80 10566
Int. Cl.⁴ H01L *21/74*
U.S. Cl. 29—577 C **6 Claims**



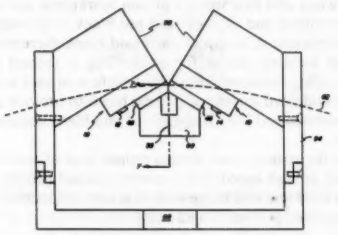
1. A process for manufacturing a substrate-fed logic operator, including a PNP injection transistor and an NPN multicollector transistor on a semiconductor wafer, comprising the steps of:
(a) providing a low-doped P-type substrate,
(b) boron implanting the substrate through a first masking layer to form a first P-type layer with high doping concentration,
(c) phosphorus implanting the substrate through a second masking layer covering part of the first P-type layer to form a second N-type layer having a high doping level, and annealing the wafer,
(d) forming, by epitaxy, a third N-type layer having a low doping level and overlying all previous layers,
(e) phosphorus diffusing the epitaxial third layer through a third masking layer to subsequently form an emitter access to the second N-type layer through said epitaxial third layer, and annealing,
(f) boron diffusing the third epitaxial layer through a fourth masking layer, to form a fourth P-type layer of high doping level, corresponding to base contacts and separation between collectors of said NPN multicollector transistor, said fourth layer subsequently diffusing down to said second layer,
(g) boron implanting said third epitaxial layer through a fifth masking layer to form a fifth P-type layer of intermediate doping level, corresponding to the base of said NPN multicollector transistor,
(h) introducing an N-type impurity in the epitaxial third layer through a sixth masking layer to form a sixth N-type layer of high doping level corresponding to collector regions of said NPN multicollector transistor, and
(i) forming metal contacts with said emitter access, with said fourth layer and with said sixth layer.

4,550,492

METHOD OF MANUFACTURING A MULTITRACK MAGNETIC HEAD

James U. Lemke, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 254,249, Apr. 15, 1981, Pat. No. 4,477,853.
This application Jul. 2, 1984, Ser. No. 610,906
Int. Cl.⁴ G11B *5/42*
U.S. Cl. 29—603 **3 Claims**



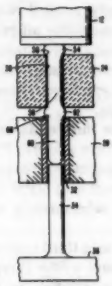
1. A method of making an integrated magnetic head comprising the steps of
(a) doping parts of a semiconductor wafer to form electronic components therein,
(b) depositing a film of magnetic material on parts of said wafer for cooperation with said electronic components,
(c) cutting said wafer into parts through said films of magnetic material,
(d) depositing non-magnetic material on one or more of the edges of said film formed by cutting said wafer into parts, and
(e) holding said wafer parts in side-by-side relationship with said non-magnetic material therebetween so as to form a transducer gap between the two parts of said magnetic film.

4,550,493

APPARATUS FOR CONNECTING CONTACT PINS TO A SUBSTRATE

Russell E. Darrow, Endicott; Glenn J. Ingraham, Vestal, both of N.Y.; John D. Larnerd, Owego, N.Y., and Robert W. Nesky, Nicholson, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 8, 1984, Ser. No. 578,147
Int. Cl.[4] H05K *3/32*
U.S. Cl. 29—739 **14 Claims**



1. A device for forming a head and bulge on a predetermined end and an inner portion, respectively, of at least one elongated pin blank, each said blank being located in a mutually exclusive pin receiving hole of a workpiece and extending outwardly from first and second surfaces of said workpiece, said device connecting each said blank to said workpiece in each said hole between said head and bulge thereof, said device comprising:

a die block having a third surface and an opening aligned with each said hole of said workpiece, each said opening extending inwardly from said third surface and receiving therein the other end of a said blank, said third surface being spaced from said second surface of said workpiece,

means for restraining each said pin blank against axial movement;

spring means for resiliently supporting said workpiece adjacent said third surface of said die block;

first locating means for controlling a first distance extending between said first surface of said workpiece and said predetermined end of each said pin blank to provide a first predetermined length of each said blank therebetween;

second locating means for controlling a second distance extending between said second surface of said workpiece and said third surface of said die block to provide a second predetermined length of each of said blank therebetween; and

means for striking said predetermined end of each said pin blank at high speed with a predetermined energy to form said head and said bulge with said first and second lengths, respectively, of each said blank.

4,550,494

AUTOMATED PRINTED CIRCUIT BOARD ASSEMBLY METHOD

Robert S. Wilks, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

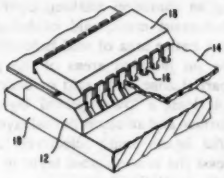
Filed Jun. 22, 1984, Ser. No. 623,681
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—838 **4 Claims**

1. The method of assembling in automated fashion lead-mounted electric components to a printed circuit board, comprising:

(a) stationing a magnetic field-controllable base, adapted to receive a plurality of lead-crimping anvils of ferromagnetic material thereon, within the working envelope of a robotic manipulator;

(b) controlling said magnetic field-controllable base to provide a moderately low strength magnetic field;

(c) selectively positioning and orienting said crimping anvils on said base in an array to completely accommodate the leads of all the lead-mounted electrical components to be crimped for a given circuit board;



(d) increasing the field strength of said base to provide an adequately high strength field to ensure retention of said anvils in the proper location and orientation during subsequent steps; and

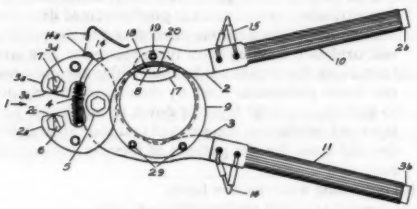
(e) mounting said components to said board and crimping said leads to produce said given circuit board.

4,550,495

NUT KERNEL EXTRACTOR

Gaston G. Fornes, 2400 Bennington Rd., Charlottesville, Va. 22901

Filed Feb. 16, 1983, Ser. No. 449,590
Int. Cl.[4] A47J *43/26;* **B26B** *17/00*
U.S. Cl. 30—120.3 **1 Claim**



1. A nut kernel extractor comprising:

(a) first and second handles, each of said handles having a major longitudinal axis, wherein each of said handles has a first end and a second end,

(b) wherein said handles are pivotally connected at a point between said first ends and said second ends such that each of said handles comprises a right side extending from said pivotal connection to said second end and a left side extending from said pivotal connection to said first end,

(c) said extractor further comprising a first nipper mounted on said first end of said first handle and a second nipper mounted on said first end of said second handle,

(d) wherein each of said nippers comprises a linear cutting edge, wherein

(e) said nippers are mounted such that said linear cutting edges are always parallel,

(f) and wherein each of said nippers also comprises a sharpened relieved section,

(g) wherein said nippers are positioned on said first ends such that one of said cutting edges is pivotally positionable close enough to said other cutting edge to cut the shell of a split nut,

(h) and wherein said extractor further comprises a splitter and a slotted safety ring wherein said splitter is mounted on said right side of said first handle and said safety ring is attached to said right side of said second handle,

(i) wherein said splitter comprises a shoulder wherein said

shoulder comprises a surface which is substantially perpendicular to the surface of said splitter thereby preventing excessive penetration of said splitter,

(j) wherein said safety ring has a pocket comprising a relieved section in said safety ring and wherein said pocket is positioned opposite to said splitter such that when force is applied to a nut with said splitter, the nut is held securely in said pocket,

(k) said extractor further comprising biasing means connected to said left side of each of said handles wherein said biasing means urge said first ends apart,

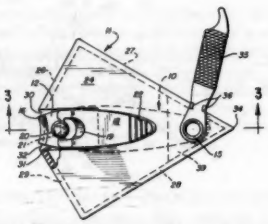
(l) said extractor further comprising retractable locking means comprising a retractable locking pin and a single leaf detent spring wherein said pin has two circumferential grooves and said pin passes through said left side of said second handle and protrudes from said second handle to obstruct the relative rotation of said first and second handles when said pin is in a locking position, and wherein said spring is positioned adjacent to said pin such that said spring rests in one of said grooves when said pin is in a retracted position and in the other of said grooves when said pin is in a locking position.

4,550,496

NAIL CLIPPER RECEPTACLE

Raymond C. Reinicke, Box 5402 RFD, Long Grove, Ill. 60047

Filed Apr. 27, 1984, Ser. No. 605,015
Int. Cl.[4] A45D *29/02*
U.S. Cl. 30—124 **2 Claims**



1. In combination with a nial clipper having two relatively movable jaw members with mating cutting edges, a jaw-operating means associated with the jaw members for manipulating the cutting edges thereof, and means securing the jaw members together in spaced relationship, a nail clippings receptacle comprising a top member, a bottom member, and a plurality of side members, said receptacle being quadrilateral shaped, the receptacle having a concave opening therein sized to receive the nail clipper and slightly oversized with respect to the clipper jaws, and jaw member securing means extending through the receptacle top and bottom members for securely positioning the nail clipper within the receptacle with the cutting edges of the jaw members being positioned within the opening of the receptacle while permitting rotational movement of the clipper about the securing means between either side of the opening and side top and bottom members having first edges angled toward one another adjacent the opening and second edges progressively narrowing and meeting at an apex opposite said opening.

4,550,497

TOOL TO PRODUCE A NEW ANGLE ON A FAN BLADE

Harold M. Sharon, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 322,097, Nov. 16, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,135
Int. Cl.[4] B23D *79/08*
U.S. Cl. 30—169 **4 Claims**

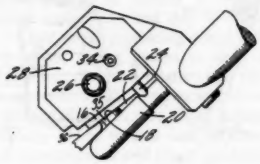
1. A cutting tool for use in producing a new angle for the opposite sides of a fan blade at a point closely spaced from the leading edge including:

a mounting block;

a handle extending from said mounting block;

a tool bit secured in said block and having an exposed cutting edge;

a pin in said block in the same plane as the cutting edge and spaced therefrom forming a notch with said cutting edge



and making the desired blade edge angle with the cutting edge with the blade edge positioned between said cutting edge and pin, said cutting edge and pin extending at an obtuse angle to the handle; and

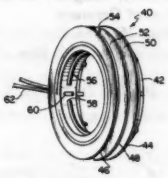
means adjacent the base of the notch to engage the blade edge for limiting the depth of movement of the blade edge into said notch, the blade thus cutting one side surface of the blade adjacent the edge.

4,550,498

REPLACEMENT SPOOL FOR ROTATING LINE VEGETATION CUTTER

Ronald A. Oliver, 8940 Tarragon Ct., Manassas, Va. 22110

Filed Feb. 17, 1984, Ser. No. 581,032
Int. Cl.[4] A01D *50/00*
U.S. Cl. 30—276 **5 Claims**



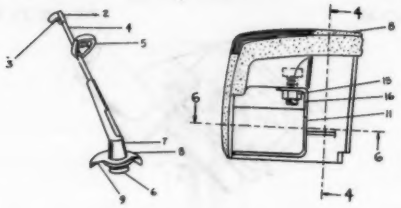
1. A replacement spool for a rotating line vegetation cutter comprising a central generally cylindrical hub portion, a pair of outer flanges on the outside surface of said hub portion at the ends of said hub portion, a central flange between said outer flanges for dividing said spool into two sections for receiving line wound on said hub in each section, an elongated line receiving slot formed in said hub portion and extending substantially parallel to the longitudinal axis of said hub portion, said elongated slot being positioned on said hub so as to extend beneath said central flange and being of a length such as to extend from approximately the middle of one of said sections to approximately the middle of the other of said sections, and a continuous length of vegetation cutting line wound on said spool in such a manner that one end of said line is wound in one of said sections and the other end of said line is wound in the other of said sections, and a midsection of said line lies in said slot behind said central flange and connects the ends of said line.

4,550,499

STRING TRIMMER WITH CUT LINE RETENTION POCKET

Alan V. Ruzicka, Santa Monica, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Jul. 18, 1983, Ser. No. 515,015
Int. Cl.⁴ A01D *50/00*
U.S. Cl. 30—276 **12 Claims**



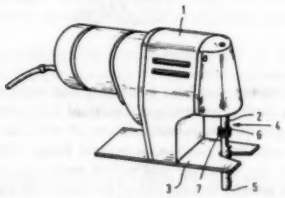
1. An apparatus for cutting vegetation and the like comprising head means rotatable about an axis in a cutting plane, flexible line member having at least one portion coiled within said head means and having at least one uncoiled portion extending outwardly of the periphery of said head means and rotating in said cutting plane, a housing means generally overlying at least an arc of the portion of said cutting plane in which said uncoiled portion rotates, and cutting means associated with said housing means and spaced from said axis in said cutting plane for trimming said line member to a predetermined length upon rotation of said head means, the improvement comprising catching means located on said housing for catching and retaining segments of said line member cut by said cutting means so that the danger of personal injury to persons in the vicinity of said apparatus when said head means is rotating and said line member is cut is reduced.

4,550,500

COMPASS SAW WITH A CONNECTING DEVICE FOR A FLAT SAW BLADE

Gerhard Kuhlmann, and Bernhard Remmele, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 535,774
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247178
Int. Cl.⁴ B23D *49/16*
U.S. Cl. 30—392 **7 Claims**



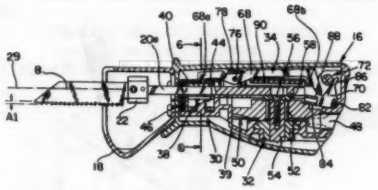
1. In a motor-driven compass saw, a combination comprising an elongated reciprocating rod; a flat saw blade with a flat shaft and having a longitudinal axis; and means for connecting said saw blade to said reciprocating rod, said connecting means comprising a clamping sleeve rotatable about the longitudinal axis of the saw blade and provided with a bore through which the shaft of the saw blade passes to be connected to the reciprocating rod, said shaft being formed with two opposing pins extended outwardly from its edges, said clamping sleeve being formed with two additional bores extended radially outwardly from said bore and opposing each other, said reciprocating rod having an end portion adapted to support an end of said shaft, said reciprocating rod being substantially flat; and a rotary member connected to the end of the reciprocating rod and aligned therewith in the direction of elongation thereof, said rotary member being inserted into said clamping sleeve and connected thereto by internal and external threads respectfully formed on the rotary member and the clamping sleeve, said rotary member having a substantially flat perforation extended in the direction of elongation of the reciprocating rod and the direction of elongation of said saw blade, said perforation being formed so that it receives said shaft after the latter has passed said bore but prevents said pins from entering said perforation, and also receives the end of the flat reciprocating rod to tightly connect said rotary member to said reciprocating rod, said rotary member being formed with surface means in which said pins of said shaft are clamped whereby said clamping sleeve is clamped with said shaft when the said sleeve is connected to the rotary member.

4,550,501

ORBITAL-ACTION RECIPROCATING POWER SAW

Robert G. Moores, Jr., Reisterstown, Md.; Daniel H. Sides, New Freedom, Pa., and Howard L. Burnside, Upperco, Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 23, 1984, Ser. No. 573,199
Int. Cl.⁴ B27B *11/02*
U.S. Cl. 30—393 **21 Claims**



16. An orbital-action reciprocating power saw, comprising:
saw blade carrier means for supporting a saw blade;
reciprocating motion means located on one side of the saw blade carrier means for transmitting reciprocating motion to the carrier means;
transverse motion means located on the other side of the saw blade carrier means for transmitting motion to the carrier means in a direction transverse to the axis of reciprocation of the saw blade carrier means wherein the transverse motion means comprises a rocker arm pivotally mounted intermediate its ends and having one end for moving said saw blade carrier means;
driving means for providing driving motion to the reciprocating motion means and the transverse motion means so that the saw blade carrier means moves in a composite orbital path wherein the driving means comprises a rotatably driven member having an axial-face cam surface with rising and declining profile portion for facilitating movement of the other end of said rocker arm.

4,550,502

DEVICE FOR ANALYSIS OF RECORDED ELECTROCARDIOGRAM

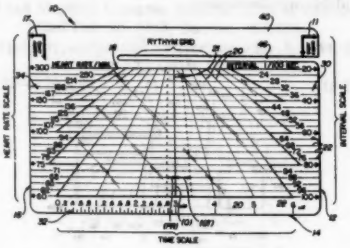
Joseph Grayzel, 262 Fountain Rd., Englewood, N.J. 07631

Filed Apr. 15, 1983, Ser. No. 485,287
Int. Cl.⁴ A61B *5/04*; G01B *3/02*
U.S. Cl. 33—1 B **8 Claims**

1. A gauge which facilitates the analysis of a recorded electrocardiogram which comprises a flat sheet of transparent material having:
(a) a plurality of straight diverging lines disposed on said

sheet with the lines being spaced apart at equal angular increments;

(b) a plurality of straight, parallel lines disposed on said sheet extending in a direction transverse to said diverging lines and perpendicular to a line extending medially between the outermost of said diverging lines, said diverging lines intersecting said parallel lines as to define equal increments, along a given parallel line, and said transverse lines being spatially arranged such that they intersect with said diverging lines to form a grid therewith wherein the distance between adjacent points of intersection with said



diverging lines on any of the parallel lines bear a relation to the heart beat rates or heart rate cycle interval of a periodic wave form recorded on an electrographic chart or strip;

(c) indicia means disposed on said sheet for designating the transverse parallel lines as graduations of a scale comprising intervals which correspond to said heart rate cycle intervals or heart beat rates; and

(d) said gauge being physically sized so that said diverging lines are laterally spaced apart to encompass at least two heart beat cycles of said periodic wave form.

4,550,503

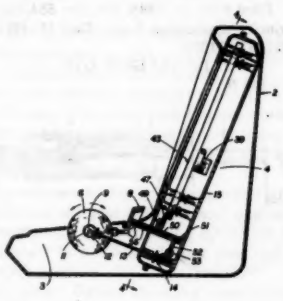
TOY COMPUTER IMAGE PROCESSOR ASSEMBLY

Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.

Filed Jun. 15, 1984, Ser. No. 621,196

Int. Cl.⁴ B43L *13/00*

U.S. Cl. 33—18 R **5 Claims**



1. A toy assembly simulating an image processing computer comprising: a closed console housing including a keyboard section and a screen section; manual actuating means mounted on said keyboard section for manual manipulation by a child; image producing means movably mounted in said screen section; a flat translucent sheet forming the front surface of said screen section; powdered material disposed in said housing adapted to move toward the inner surface of said sheet to adhere thereto and render said sheet opaque; and mechanical linkage means disposed within said console housing connected at one end to said manual actuating means on said keyboard section and at the other end to said image producing means in said screen section to selectively move said image producing means into and out of contact with said powdered surface of said sheet and in selected contacting directions along said sheet to remove powdered material therefrom and produce preselected images thereon, said manual actuating means on said keyboard section including separate members to control the directional movement of said image producing means along said powdered sheet and to control the movement of said image producing means into and out of contact with said powdered sheet, said image producing means including a movably mounted stylus; spring means to urge said movably mounted stylus in one direction relative said powdered sheet; and spring compression means to move said movably mounted stylus in an opposite direction, said spring compression means being mechanically linked to said manual actuating member which controls movement of said image producing means into and out of contact with said powdered sheet.

4,550,504

METHOD AND APPARATUS FOR THE MEASUREMENT OF THE LENGTH OF A STRAIGHT LINE OR AN ARC

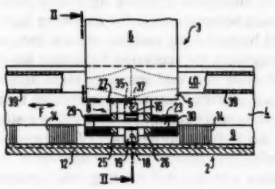
Walter Mehnert, Grillparzerstr. 6, D-8012 Ottobrunn, Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,376

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151798

Int. Cl.⁴ G01B *11/02*

U.S. Cl. 33—125 C **28 Claims**



1. A method for measuring the distance between a first marking which is provided on a first body and at least one second marking which is one of a plurality of markings provided on a first marking carrier which is fixedly connected to a second body, said bodies being movable with respect to each other, comprising

(a) providing a first sensor movably attached to said first body and being adapted during its movement to sense each marking of said plurality of markings;

(b) imparting oscillatory movemeht to said first sensor for oscillatory movement thereof with respect to said first body independent of the relative movement of said two bodies, said first sensor moving to and fro between two reversal points in a direction being essentially parallel to the direction of relative movement of said two bodies and crossing said at least one second marking at each to and fro stroke of said oscillatory movement;

(c) generating at each crossing by said first sensor of said at least one second marking, a time-significant signal correlated in time to the crossing event;

(d) generating a reference signal for each to and fro stroke of said oscillatory movement of the first sensor when the latter is predeterminatally related to said first marking;

(e) measuring the distance, as a function of time, between said time-significant signal and said reference signal during at least one of the strokes of said oscillatory movement;

(f) providing a value, representing the mean value of the velocity of said oscillatory movement, between the gener-

ation of said time-significant signal and said reference signal; and

(g) determining from step (c) to (f) the unknown distance between said first and said second marking.

4,550,505

INSTRUMENT FOR MEASURING LENGTHS

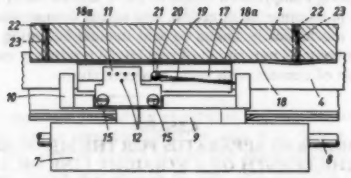
Heinz Rieder, Riedersbach 90, A-5120 St. Pantaleon, and Max Schwaiger, A-5121 Ostermiething No. 298, both of Austria

Filed Nov. 8, 1984, Ser. No. 669,608

Claims priority, application Austria, Nov. 22, 1983, 4087/83

Int. Cl.⁴ G01B *11/04*

U.S. Cl. 33—125 C **6 Claims**



1. In an instrument for measuring lengths, comprising

a carrier,

a rule secured to said carrier and provided with a light-modifying scale,

an optoelectronic scanning unit which is movable along said scale and comprises a plurality of parts, including light-emitting means for emitting light onto said scale, a light-modifying scanning plate for receiving light that has been emitted by said light emitting means onto said scale, and light receivers for receiving light that has been modified by said scale and said scanning plate and for generating changing electric outputs in response to the light thus received as said scanning unit is moved along said scale,

auxiliary tracks for guiding a part of said scanning unit along said scale,

an actuating member for moving said scanning unit along said scale, and

yieldable connecting means which are yieldable transversely to the longitudinal direction of said scale and connect said actuating member to a part of said scanning unit,

the improvement residing in that

said rule has a surface which constitutes one of said auxiliary tracks,

said scanning plate bears on and is guided by said auxiliary tracks,

said light-emitting means and said light receivers are rigidly secured to said actuating member, and

said yieldable connecting means connect said actuating member to said scanning plate.

4,550,506

MEASURING MACHINE

Takao Katayama, No. 21-2, 2-chome, Chuo, Ohta-ku, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,359

Claims priority, application Japan, Sep. 14, 1982, 57-15880

Int. Cl.⁴ G01B *7/02*

U.S. Cl. 33—143 L **1 Claim**

1. A measuring machine, comprising:

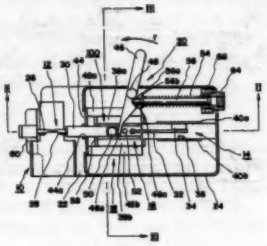
a housing provided with a base and a casing mounted on the base;

means, secured to the base, for measuring a dimension of an object, said measuring means having a stationary measuring contact point, a movable measuring contact point, a slidable spindle means for carrying the movable measuring contact point into contact with the stationary measuring contact point, said slidable spindle means having longitudinal rectangular slots in opposite sides thereof;

sensor means, attached to one end of the slidable spindle means, for reading the dimension obtained by the measuring means;

means, attached to the base, for guiding movement of the slidable spindle means, said guiding means including bars arranged on the opposite sides of the slidable spindle means, said bars having longitudinal rectangular slots in opposite sides thereof;

actuator means, mounted on the casing, for moving the slidable spindle means;



at least a pair of linear bearings, positioned between the slots in the opposite sides of the slideable spindle means and the slots in the sides of the bars of the guiding means, each of said pair of linear bearings including a supporting frame having a plurality of supporting brackets, a plurality of tubular rollers having cylindrical shafts, each of the plurality of tubular rollers being rotatably supported by one of the plurality of supporting brackets and having its longitudinal axis perpendicular to but spaced equidistant from longitudinal axes of adjacent ones of the plurality of tubular rollers.

4,550,507

THREAD CONSTRUCTION IN LENGTH MEASURING INSTRUMENT AND METHOD FOR MANUFACTURING THREAD CONSTRUCTION

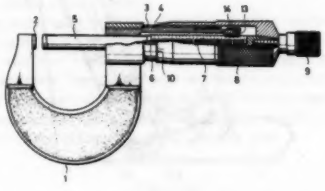
Goro Nishikata, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,412

Claims priority, application Japan, Dec. 15, 1982, 57-221035; Dec. 15, 1982, 57-221036

Int. Cl.⁴ G01B *3/18*

U.S. Cl. 33—164 R **10 Claims**



1. A thread construction of a length measuring instrument wherein a frame body comprises an anvil and a spindle linearly movable to and from said anvil and said spindle is of a screw feed type, an externally threaded portion provided on said spindle and made of a ceramic material, and an internally threaded portion provided on said frame body and coupled to said externally threaded portion and defined by a plurality of externally threaded pieces cut out of an externally threaded member made of a material identical with and having a pitch equal to said externally threaded portion, each said piece being

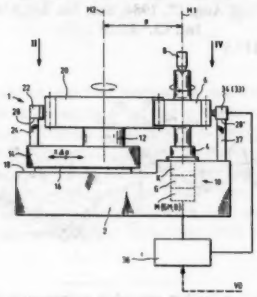
secured to an inner peripheral surface of said frame body at arcuately spaced intervals and where said externally threaded portion is positioned.

4,550,508

DOUBLE-FLANK COMPOSITE ERROR TESTER

Hans Spaeth, Kloten, Switzerland, assignor to Maag Gear-Wheel and Machine Company Limited, Zurich, Switzerland

Filed Feb. 25, 1985, Ser. No. 705,150
Claims priority, application Switzerland, Mar. 1, 1984, 996/84
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—179.5 C **18 Claims**



1. A double-flank composite error tester for determining gear errors and comprising:

at least one first gear holding support;

at least one spring-loaded displaceable slide;

said at least one first gear holding support being mounted at said at least one spring-loaded displaceable slide;

a second oear holding support;

said at least one spring-loaded displaceable slide being displaceable relative to said second gear holding support;

said at least one first gear holding support and said second gear holding support supporting at least one pair of gears to be tested;

each one of said gears of said at least one pair of gears to be tested defining respective gear teeth with a predetermined number of tooth tips and tooth spaces;

aligning means for mutually aligning the gears of said at least one pair of gears to be tested such that the tooth tip of one gear of said at least one pair of gears to be tested is aligned with the tooth space of the other gear of said at least one pair of gears to be tested;

said aligning means including gear teeth means fixedly associated with said one gear of said at least one pair of gears to be tested and a magnet acting upon said gear teeth means in order to position said one gear in a predetermined rotary position;

said aligning means further including a positioning device associated with said other gear of said at least one pair of gears to be tested;

said positioning device positioning said other gear in a predetermined relative position with respect to said predetermined rotary position of said one gear of said at least one pair of gears to be tested; and

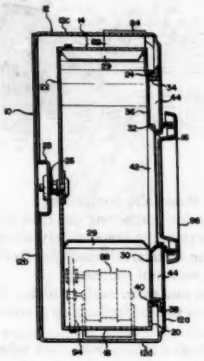
means for interengaging the gear teeth of said one gear and said other gear of said at least one pair of gears to be tested after aligning said one gear and said other gear by said aligning means.

4,550,509

AIR GUIDE ARRANGEMENT FOR A DRUM-TYPE DRIER

Koji Murase, Ichinomiya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 9, 1983, Ser. No. 492,828
Claims priority, application Japan, Jun. 16, 1982, 57-104120
Int. Cl.[4] D06F *58/00*; F26B *11/02*
U.S. Cl. 34—133 **8 Claims**



1. A drum type drier comprising:

a housing having a front board with an opening therein;

a drum, rotatably provided in the housing to receive clothing to be dried, said drum including a cylindrical body and first and second end plates closing both ends of the cylindrical body, the first end plate having a circular opening formed concentrically with the drum;

a frame-like air guide fixed to the front board around the front board opening, positioned in the circular opening of the first end plate for rotatably supporting the drum and defining an inlet-outlet port through which clothing is placed into or removed from the drum;

first guide means having an air inlet positioned in the air guide and communicating with the interior of the drum to guide air into the drum;

second guide means having an air outlet positioned in the air guide and communicating with the interior of the drum to guide air from the drum, said air inlet and air outlet being opposite to each other with respect to said inlet-outlet port with said inlet-outlet port arranged between them;

heating means for heating air passing through the first guide means;

driving means for rotating the drum; and

air-ventilating means which conducts heated air from the heating means into the drum through the first guide means to remove moisture from the clothing and to conduct air from the drum through the second guide means, wherein said frame-like air guide includes a cylindrical outer wall fitted in the circular opening of the first end plate, and an inner wall arranged around the opening of the front board and defining the inlet-outlet port jointly with the circular opening and the front board opening, and an annular wall having an opening, connecting the cylindrical outer wall and inner wall and being substantially flush with the first end plate, and wherein said air inlet and air outlet are formed in the annular wall, and wherein said air guide and front plate jointly define an air-discharging passage communicating with the air outlet, and said first guide means including an air-blowing cylinder provided in the air guide, communicating with the air inlet, and defining an air-introducing passage separated from the air-discharging passage.

4,550,510

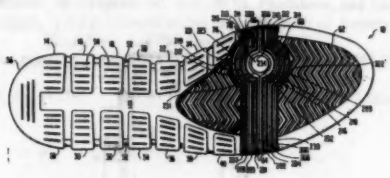
BASKETBALL SHOE SOLE

Jerry D. Stubblefield, Portland, Oreg., assignor to Pensa, Inc., Portland, Oreg.

Division of Ser. No. 250,899, Apr. 3, 1981, Pat. No. 4,449,307. This application Apr. 30, 1984, Ser. No. 605,560

Int. Cl.⁴ A43B *13/04, 13/18, 5/00*

U.S. Cl. 36—32 R **7 Claims**



1. A basketball shoe sole, comprising:

an outer surface for contacting the basketball floor;

groove means extending transversely along said outer surface across the metatarsal heads for facilitating flexing of the shoe sole and foot thereat;

means formed in said outer surface under the position of the ball of the great toe for facilitating pivoting of the sole and foot thereat,

wherein said pivoting means comprises substantially circular pivot cup means and a portion of said groove means;

wherein said portion of said groove means is substantially semi-circular and is formed above and below said pivot cup means; and

wherein said groove means further includes substantially linear portions on both sides of said pivot cup means that connect with said semi-circular portions in a continuous manner.

4,550,511

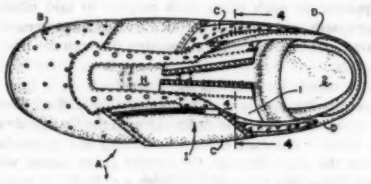
INSTEP SUPPORT FOR FOOTWEAR

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 319,682, Nov. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 458,219, Jan. 17, 1983, abandoned, and a continuation-in-part of Ser. No. 481,165, Apr. 11, 1983,. This application Apr. 22, 1983, Ser. No. 487,881

Int. Cl.⁴ A43B *11/00*

U.S. Cl. 36—50 **13 Claims**



1. In an instep support for footwear, and being a shoe of the type having an upper incorporating a vamp, quarter and heel portions, all securing together and being integrally connected with the shoe sole, a gusset provided within the shoe upper, an insole applied upon the shoe sole, the improvement which comprises, a support system provided within the shoe and useful for furnishing of support for the instep, arch, and associated components of the foot of the wearer, said support system including band means extending upwardly from the insole and arranged for overlying substantially the entire instep for the foot and being snugly secured therewith for bracing the foot within the applied shoe, said band means operatively associated with the insole means for the shoe and extending upwardly therefrom for also embracing the lateral arch portions of the foot in conjunction with the application of bracing to its instep, said band means incorporating a pair of band members, at least one of said band members extending upwardly from the insole means substantially inwardly from its lateral edge to also embrace the arch portion of the contiguous foot of the shoe wearer, said insole means having a central portion, said central portion of the insole means having a pair of slots formed therethrough, the band means inserting through said pair of slots for underlying the central portion of the insole means intermediate said pair of slots, said band means projecting upwardly through said slots and extending upwardly along the lateral portions of the arch and around the instep of the foot of the shoe wearer.

4,550,512

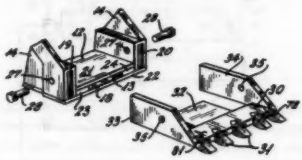
EXCAVATOR BUCKET WITH DETACHABLE IMPLEMENTS

Rickerd M. Felstet, P.O. Box 341, East Helena, Mont. 59635

Filed Aug. 17, 1984, Ser. No. 641,654

Int. Cl.⁴ E02F *3/76*

U.S. Cl. 37—117.5 **11 Claims**



1. An excavator bucket assembly comprising the combination of a bucket means and earth working implements, said bucket means having a foward lower edge portion, a rear wall and oppositely disposed side walls, said forward lower edge portion having a first socket means therein for selectively receiving and mounting one of said earth working implements therein so as to project from said forward lower edge portion, said first socket means being defined by spaced walls which form at least a portion of said forward lower edge portion, second and third socket means provided adjacent each of said side walls of said bucket means and extending from adjacent said forward lower edge portion toward said rear wall of said bucket means, said earth working implements having earth engaging means supported on a tool bar means, said tool bar means having spaced ends, a first tang means extending rearwardly from said tool bar means and intermediate said ends thereof so as to be selectively receiveable within said first socket means, said earth working implements having second and third tang means which extend rearwardly therefrom on opposite sides of said first tang means so as to be selectively receivable in said second and third socket means, respectively, and fastening means for selectively connecting said tool bar means to said bucket means.

4,550,513

REPLACEABLE WEAR-EDGE ROUTER BIT

Robert Rasmussen, Rancho Palos Verdes, Calif., assignor to Industrial Parts Depot, Torrance, Calif.

Continuation-in-part of Ser. No. 217,953, Dec. 19, 1980, abandoned. This application May 4, 1984, Ser. No. 607,243

Int. Cl.⁴ D06F *79/00*

U.S. Cl. 37—141 R **19 Claims**

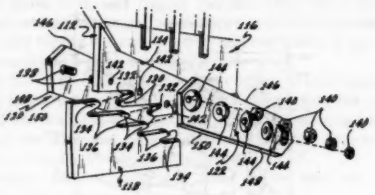
1. A router bit for use with earth moving equipment comprising:

a first member having a forward end and a rear end and being adapted to be mounted on said earth moving equipment;

a lower insert including a portion defining an earth cutting edge;

said first member having a first plurality of downwardly and forwardly extending finger means and finger apertures, said lower insert having a second plurality of finger means and finger apertures extending upwardly and rearwardly, said first and second pluralities interlocking to prevent upward and rearward movement of said insert relative to said first member; and

retainer means comprising at least one pair of side plates releasably affixed in opposing relationship to opposite



sides of one of said first member or said insert, each side plate having an upper edge and a lower edge, said side plate being crowned concavely in a direction generally transverse to both said edges, each side plate being affixed with its concave side facing said first member and with said upper edge lying against said first member and said lower edge against said insert such that said lower edges clamp said insert against separation from said first member.

4,550,514

STEAM IRON

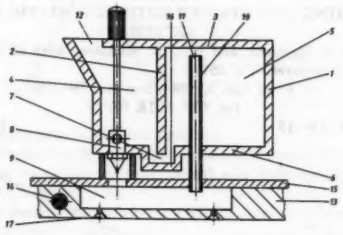
Gerald Reiss, Friedhofstrasse 5, D-6050 Heusenstramm 2, and Rudolf Schneider, Schnurstrasse 11, D-645 Hanau (Main), both of Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 638,092

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328453

Int. Cl.⁴ D06F *75/18*

U.S. Cl. 38—77.81 **5 Claims**



1. A steam iron comprising: a water tank; said tank having a dividing wall dividing said tank into first and second chambers; an electrically heated sole-plate; a vaporizing chamber formed in said sole-plate; a drip valve mounted in said first chamber to supply water from said first chamber to said vaporizing chamber; means connecting said first chamber to atmosphere; said dividing wall of said tank being connected in sealed manner to an inner wall of said tank; means defining at least one opening in a lower region of said tank to put said first and second chambers in flow communication; and a tube connecting said vaporizing chamber to said second chamber, the mouth of the tube opening into said second chamber above the filling level of water therein.

4,550,515

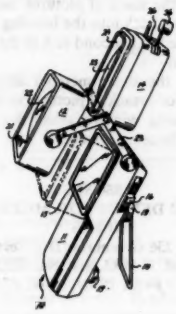
X-RAY AND PHOTOGRAPHIC VIEWER

Robert N. Simmons, 30 N. Michigan Ave., Suite 1204, Chicago, Ill. 60602

Continuation-in-part of Ser. No. 322,646, Nov. 18, 1981, Pat. No. 4,454,669. This application Oct. 31, 1983, Ser. No. 546,838

Int. Cl.⁴ G02B *27/02*

U.S. Cl. 40—362 **8 Claims**



1. A portable transparency viewer for viewing X-ray film, photographic slides, filmstrips and like items, comprising, in combination, a viewer body having a fixed imaging screen upon which items to to viewed may be placed for direct viewing, a light source disposed behind the imaging screen within said viewer body, power means contained within said viewer body for permitting selective energization of said light means to illuminate said screen, first magnifying means, adjustable support means for positioning said first magnifying means in parallel spaced relation relative to said screen to permit magnified viewing of items disposed on said fixed imaging screen, and auxiliary removable magnifying means adapted for selected releasable engagement with said viewer body over said viewing screen and including means for receiving items between said auxiliary magnifying means and said screen so as to permit selective viewing of said received items directly through said auxiliary magnifying means as well as through both said first and auxiliary magnifying means.

4,550,516

PICTURE VIEWER

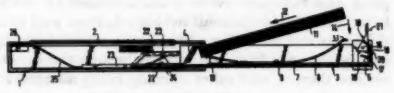
Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Dec. 12, 1983, Ser. No. 560,385

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246103

Int. Cl.⁴ G09F *11/30*

U.S. Cl. 40—513 **14 Claims**



1. A picture viewer comprising:

(a) a housing member adapted to accommodate a stack of pictures of substantially equal size, the housing member having a top wall provided with a viewing window, a bottom wall opposite the top wall, side walls, a rear end wall, and an open front end;

(b) a slider member adapted to slide into and out of the open front end of the housing parallel to the plane of the viewing window of the housing member;

(c) a picture exchange means comprising: (i) a separator bar adapted to move pictures in the stack of pictures out of the

housing member when the slider is moved out of the housing member; and (ii) a retentive element in the housing member adapted to engage a first picture in a stack of pictures in the housing member to retain the first picture in the housing member when the slider is moved out of the housing member, the first picture being at a first end of the stack of pictures, whereby, in use, when the slider member is moved out of said housing member, the first picture is separated from the stack of pictures and when the slider member is moved back into the housing member, the first picture is returned to a second end of the stack opposite to the first end; and

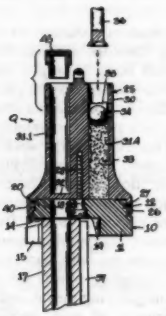
(d) bias means in the slider member adapted to urge the topmost picture of a stack of pictures in the picture viewer against the viewing window when the slider member is moved into the housing member.

4,550,517

QUICK-LOADING DEVICE FOR MUZZLE-LOADING RIFLES

George F. Mansfield, 236 Greenbriar Dr., Cortland, Ohio 44410

Filed Jul. 7, 1983, Ser. No. 511,550
Int. Cl.[4] F42B *39/04*; F41C *27/00*
U.S. Cl. 42—90 **9 Claims**



1. A device for quickly loading a muzzle-loading gun, comprising:

a base, said base having a circular upper portion,

a cylinder extending upwardly from said base and revolvable about a pivot axis on said base, said cylinder having a circular skirt portion which closely and slidably receives said base upper portion to assist in guiding revolution of said cylinder thereon, said base having a flat upper surface slidably interengaging with a flat lower surface on said cylinder,

said cylinder having a plurality of elongated openings, the longitudinal axes of said openings being parallel to said pivot axis and disposed in a circle concentric with the latter, one of said openings having a bottom wall to close the lower end thereof at all times, the other of said openings being open from top to and through the lower flat surface thereof, said other opening being adapted to receive a charge of powder, ball and patch,

said base having an off-center hole therethrough and a recess in its lower surface for receiving the muzzle end of a gun and positioning the same in axial alignment with said hole,

said base hole being on a circle having a radius the same as the circle on which said openings are located, whereby said cylinder may be rotated about said pivot axis to align any one of said elongated openings with said base hole,

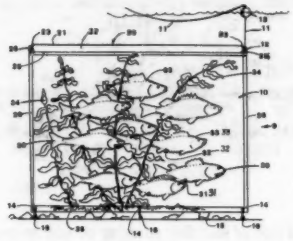
said other of said openings when said one opening is aligned with said base hole being temporarily closed by the flat upper surface of said base, thereby to be in position to receive a charge which may be transferred therefrom to the rifle muzzle by axially aligning one of said other of said openings with said base hole and pushing the charge into the rifle by means of a ram rod.

4,550,518

FISH DECOY

Alfred M. Layson, 771 N. Walnut, Waukegan, Ill. 60085

Filed Sep. 15, 1983, Ser. No. 532,409
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—2 **3 Claims**



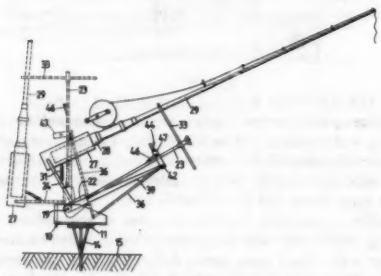
1. A fishing decoy comprising two sheets of flexible, transparent material, means for connecting the two sheets along the edges, the sheets having means defining an integral inflatable air chamber extending along the upper edge for flotation purposes and weight means fixed to the lower edge of the sheets opposite the air chamber in order to hold the decoy in a vertical position, underwater, the weight means being sufficient to cause the sheets to submerge to a desired level and the air chamber creating sufficient buoyancy to balance against the weight and maintain the sheet in the relatively vertical position, a plurality of individual life-like fish images projected on the sheet, each of said fish images being formed by a sealed outline inflatable to provide a three-dimensional form approximating the average size of the represented fish, a plurality of seaweed images to depict the fish in their natural habitat, and a retrieving line attached to the upper edge having the air chamber for the purposes of retrieving the decoy from the water.

4,550,519

FISHING ROD HOLDER WITH AUTOMATIC HOOK SETTER

Harold J. Simmons, and Billy R. Simmons, both of P.O. Box 188, Margaret, Ala. 35112

Filed Apr. 5, 1984, Ser. No. 597,126
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—15 **11 Claims**



1. A fishing rod holder with automatic hook setter comprising:

(a) a supporting frame,

(b) a rod holder operatively connected to said supporting frame in position to support the handle end of a fishing rod and adapted for vertical pivotal movement relative to said supporting frame,

(c) a trigger rod pivotally connected at one end to said supporting frame with the other end of said trigger rod being adapted to extend forwardly beneath a fishing rod supported by said rod holder,

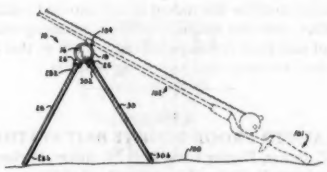
(d) a fishing rod support member carried by a forward portion of said trigger rod in position to support a fishing rod and move with said trigger rod selectively to a lower inoperative position and to an upper operative position so that the fishing rod supported by said rod holder is moved upwardly to a hook setting position,

(e) a jerk rod pivotally connected at one end to said supporting frame forwardly of the pivotal connection between said one end of said trigger rod and said supporting frame with the other end of said jerk rod extending forwardly and upwardly toward said trigger rod,

(f) resilient means urging said other end of said jerk rod upwardly toward said trigger rod,

(g) releasable means operable to connect said other end of said jerk rod to said trigger rod in a position to hold said trigger rod and said fishing rod support member carried thereby in said inoperative position and operable to release said jerk rod for movement relative to said trigger rod in response to downward movement of said other end of said trigger rod by downward movement of said fishing rod support member so that said jerk rod is urged by said resilient means in a direction to move said trigger rod and the fishing rod supported by said fishing rod support member to said hook setting position.

4,550,520
FISHING POLE HOLDER
Carl E. Bogue, 11402 E. 10th, Independence, Mo. 64054
Filed Aug. 20, 1984, Ser. No. 642,087
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 **8 Claims**



1. A fishing pole holder comprising:

a support member for said fishing pole, said support member having an imaginary longitudinal axis underlyingly traversing a fishing pole;

a stirrup member for receiving a longitudinal portion of said fishing pole therein;

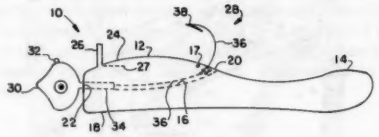
a plurality of leg members having upper and lower ends for elevating said support member;

a fastener member for engaging the upper end of each leg member thereto with said lower end contacting an underlying surface below said support member to elevate said support member from said surface;

means for selectably positioning each fastener member about said support member in a manner to position each leg member at a selectable angular relationship with said surface so as to elevate said support member above said surface; and

means for selectably positioning said stirrup about the perimeter of said support member so as to receive a portion of said fishing pole therein, said stirrup member cooperating with said elevated support member to maintain an inclination of said fishing pole having one end in contact with said surface and extending over said elevated support.

4,550,521
LURE HAVING BAIT STORAGE COMPARTMENT
Martin P. Hayden, 9951 53rd La., N., Pinellas Park, Fla. 33565
Filed May 3, 1984, Ser. No. 606,513
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—41 **3 Claims**



1. A fishing lure, comprising,

a jig head hook member,

a lure means having a body and a tail integrally formed therewith,

said lure means formed of a soft, flexible plastic,

said jig head hook member including a head portion in the image of a fish head, a hook member having a barb and a straight shank, and a boss member that receives said shank,

a hollow cavity formed in the upper half of said body, of sufficient dimension to receive a piece of bait therein,

a plurality of small openings formed in the upper, rearward quadrant of said body, just forwardly of said tail,

a first large opening formed in the proximal end of said body to receive said boss member into said cavity,

a second large opening formed in an upper, horizontal wall of said body to admit said piece of bait into said cavity,

said hook shank disposed within said cavity, mounted by said boss member to the head portion of said jig head hook member, said head portion being external to said cavity, and positioned forwardly thereof,

the barb of said hook member disposed externally of said cavity, upwardly of the body of said lure means,

said hook member extending through a preselected one of said small openings,

whereby the lure means is mounted to a jig head hook member and the hook member is disposed out of snagging engagement to the floor of the area being fished, and whereby small string-like pieces of bait will trail from said small openings attendant drawing said lure means through water.

4,550,522
LIVE BAIT VENDING APPARATUS
Ted W. Morton, 7229 E. Shea Blvd., Scottsdale, Ariz. 85254
Filed Aug. 2, 1984, Ser. No. 637,136
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **5 Claims**

1. An apparatus for vending live fishing bait such as minnows comprising:

a housing comprising two sections,

an elongated support shaft journaled in said housing to extend within one of said sections and rotatably driven by a motor means mounted in the other section,

a carrousel means mounted around said support shaft for rotatable movement thereby,

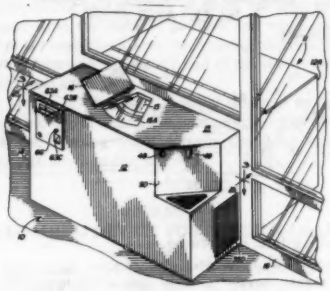
said carrousel means comprising a ring-like circular tank divided into a plurality of sequentially positioned compartments extending around said tank,

said one of said sections containing water which substantially fills said tank,

means mounted in the other of said sections in fluid communication with said one of said sections to aerate, filter and

maintain the temperature condition of the water in said one of said sections,

said means to aerate, filter and maintain the temperature includes a valve controlled outlet for dispensing in a time controlled manner water from said one section to outside of said housing and into a minnow bucket of a purchaser of said bait,



said housing comprising means for viewing bait in at least one of said compartments and exposing and removing the bait observed in said one of said compartments when said apparatus is actuated, and

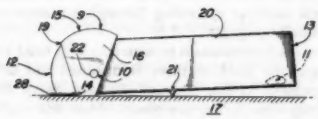
a money controlled means for rotatably indexing said carrousel means to successivelv register a compartment with said means for viewing and exposing said bait for removal of the bait observed from the apparatus.

4,550,523

DISPOSABLE OR REUSABLE ANIMAL TRAP

Robert S. Spiller, 24676 Mendocino Ct., Laguna Hills, Calif.

Filed Jan. 9, 1984, Ser. No. 569,223
Int. Cl.[4] A01M *23/02*
U.S. Cl. 43—61 **9 Claims**



1. An animal trap, comprising:

a housing defining an enclosure having an entrance opening therein and short cylindrical appendages adjacent the entrance opening;

an integral fulcrum at the approximate midpoint of the bottom exterior surface of the enclosure, such fulcrum permitting the entire enclosure to assume a downward inclination toward whichever end of the enlosure a trapped animal chooses to occupy;

a door member attached to the exterior of the enclosure and pivoting thereon in an arc between positions allowing access through, and closure of, said entrance opening;

said door member consisting of a surface conforming to the shape of the open end of the enclosure, and two sides, each side having a hole which permits the door member to be pivotally mounted on the short cylindrical appendages on the enclosure; and

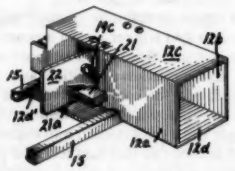
said appendages on the enclosure exterior located horizontally and vertically on the side of the enclosure so as to facilitate a pivotal axis such that: (a) an arc is provided for the door surface to traverse so that part of the arc affords closure of the entrance opening and a contiguous part of the arc allows the entrance opening to be unobstructed, and (b) an arc path is provided for a point on the door member side panel opposite the door surface, such that, when the trap is viewed in profile, the arc path pass beneath the enclosure bottom surface whenever the door is in transition from an opened to closed or closed to opened position whereby the surface on which the enclosure rests prevents rotation of the door whenever the enclosure assumes a downward inclination toward the end thereof corresponding to the entrance opening to facilitate such obstruction.

4,550,524

RODENT TRAP

Joseph A. Goebel, 319 S. Barker Ave., Evansville, Ind. 47712

Filed Aug. 23, 1984, Ser. No. 643,554
Int. Cl.[4] A01M *23/10, 23/30*
U.S. Cl. 43—75 **7 Claims**



1. A rodent trap comprising a rodent receiving chamber, bait retaining means within said chamber selectively controlling operational sequence, said chamber having a floor with a slidable portion continually urged into a position overlying a rodent receiving member, a partition movable across said chamber from a first position to a second or eradicating position, means moving said partition in response to movement of said bait retaining means to eradicate said rodent, said partition and said slidable portion of said floor being operatively connected so as to be movable together out of said rodent receiving chamber to allow the rodent to fall into said rodent receiving member, and cam means selectively releasing said slidable portion of said floor from operative partition so that said floor portion may return to said overlying position.

4,550,525

TAMPER PROOF RODENT BAIT STATION

Stanley Z. Baker, Pepper Pike; Bart M. Baker, Richmond Hts., and Benjamin H. Baker, Chesterland, all of Ohio, assignors to J. T. Eaton & Company, Inc., Twinsburg, Ohio

Filed Aug. 22, 1984, Ser. No. 643,037
Int. Cl.[4] A01M *25/00*
U.S. Cl. 43—131 **17 Claims**

1. A rodent bait protection box comprised of:

a generally triangularly-shaped enclosure having a floor and at least first, second, and third enclosure walls extending vertically upright therefrom, a first corner between said first and second enclosure walls, a second corner between said second and third enclosure walls, and a third corner between said first and third enclosure walls;

rodent access entrances at each of said first and third corners;

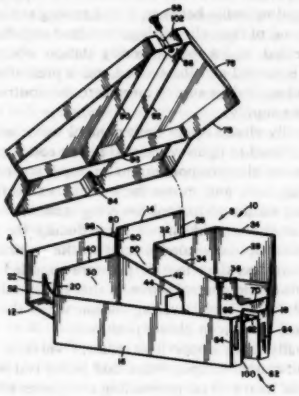
first and second bait retention areas segregated within said enclosure, each having first, second, and third partition walls in combination with a different one of said second and third enclosure walls to form said bait retention areas;

said first enclosure wall and each of said first partition walls being in parallel spaced relationship to define an entrance passageway therebetween directed from said first rodent access entrance to said second rodent access entrance;

said second partition walls being in parallel spaced relation-

ship and defining a central passageway therebetween intersecting said entrance passageway and extending from said entrance passageway toward said second corner;

said third partition walls of said rodent bait retention areas each having a bait retention area entrance, indirectly accessible from said central passageway;



said second corner provided with rodent-inaccessible opening means, perceivable from said intersection of said entrance passageway and said central passageway; and

a removable cover.

4,550,526

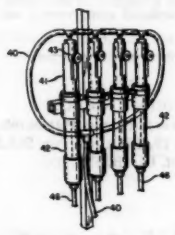
IMPLEMENT FOR CONTACT APPLICATION OF LIQUID HERBICIDES TO CROPS

Willard Smucker, 23175 Powerline Rd, Harrisburg, Oreg. 97446

Filed Jan. 23, 1984, Ser. No. 572,941

Int. Cl.[4] A01G *13/00*

U.S. Cl. 47—1.5 **5 Claims**



1. A farm implement for contact application of a liquid to growing plants, comprising:

frame means adapted to be moved across a field of growing plants on which a liquid is to be applied;

an elongated wiper bar supported by the frame means and extending transversely to the direction of movement thereof, the wiper bar comprising a plurality of longitudinally-extending sections, each of the sections comprising a rigid support member and liquid-absorbent material surrounding the support member;

a tank for the liquid mounted on the frame means above the wiper bar at a first elevation above the wiper bar;

a feed line extending downwardly from the tank for gravity feeding liquid to the wiper bar;

a plurality of drip valves connected in parallel to the feed line below the tank, each of the drip valves being at a second elevation which is less than the first elevation above the wiper bar, each of the drip valves being associated with a respective section of the wiper bar; and

a plurality of closed distribution conduit means, one of the plurality of conduit means connecting each of the drip valves with the interior of its respective section of the wiper bar for individually supplying liquid to each said section and to the material surrounding the support member thereof, each of the conduits means including sighting means for viewing the level of liquid in the conduit means;

the drip valves being adjustable and the distribution conduit means being sized to establish an independent visible head of liquid in each of the conduit means during flow of liquid from the tank, thereby to obtain a constant flow of liquid to each of the sections of the wiper bar regardless of the relative elevation of the sections with respect to each other.

4,550,527

METHOD AND MATERIAL FOR IMPROVING THE GROWTH OF PLANTS

Timothy J. Hall, Rustington, and Eric J. Tridgell, London, both of England, assignors to National Research Development Corporation, England

Filed Apr. 18, 1983, Ser. No. 486,193

Claims priority, application United Kingdom, Apr. 22, 1982, 8211679; Jul. 27, 1982, 8221637

Int. Cl.[4] C12N *1/14*

U.S. Cl. 47—58 **16 Claims**

1. The method of producing a mycorrhizal condition in a root system of the plant, which method comprises growing the plant and positioning across the path of growth of at least part of the root system, a root-penetrable, integral, self-supporting carrier material having thereon an adherent layer comprising inoculum of a mycorrhizal fungus, so that at least part of the root system of the plant grows into contact with the carrier material and thereby becomes infected.

4,550,528

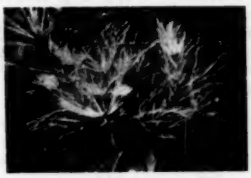
ASEXUAL PROPAGATION OF PINE TREES

Asha Mehra-Palta, Monsey, and Kimnaja Gross, Cornwall, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,750

Int. Cl.[4] A01G *1/00, 23/00*

U.S. Cl. 47—58 **9 Claims**



1. A method of asexually propagating pine trees, comprising:

(a) severing the main stem of a pine seedling at a height above the ground of up to 12 inches and detaching the branches from the remaining main stem such that only one lateral branch remains intact and attached to the remaining main step;

(b) growing the remaining main stem and attached lateral branch at least until the cut end of the remaining main stem produces shoots having juvenile characteristics;

(c) severing the shoots from the remaining stem; and

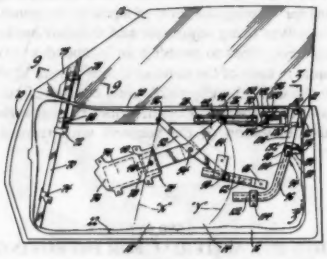
(d) rooting the shoots.

4,550,529

WINDOW STABILIZING MECHANISM

James R. Drouillard, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1984, Ser. No. 664,354
Int. Cl.[4] E05F *11/38*
U.S. Cl. 49—348 **3 Claims**



1. In a vehicle body door having a window opening and a window storage cavity beneath the window opening, a window movable between a raised position closing the opening and a lowered position stored in the storage cavity, and window regulator means connected to the window for moving the window along a defined path of movement between the raised and lowered positions, a stabilizer mechanism comprising:

a guide track mounted on the body within the storage cavity said track being curved to define a generally vertical upper portion and a more horizontal lower portion;

link means having one end associated with the track and movable therealong in a manner to enable pivotal movement of the link means with respect to the track and an other end pivotally connected to the window so that the movement of the window to the closed position causes the link means to stand up between the upper portion of the track and the window to stabilize the window and movement of the window to the lowered position causes the link means to assume a laying down position; and

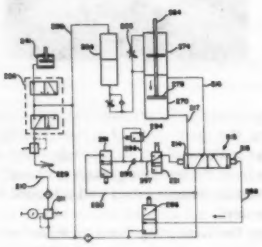
interconnecting means provided respectively between the link means and the door and between the link means and the window and adapted to automatically interconnect therebetween when the window reaches the closed position causing the link to stand up whereby the link substantially stabilizes the closed position of the window.

4,550,530

SHORT-STROKING HONING MACHINE

Donald Rottler, Seattle, and David Engnell, Issaquah, both of Wash., assignors to Rottler Manufacturing Co., Kent, Wash.

Filed Jun. 10, 1983, Ser. No. 503,279
Int. Cl.[4] B24B *5/08*
U.S. Cl. 51—34 R **2 Claims**



1. In a honing machine of the type having a honing tool, means for rotating the honing tool, and stroking means for vertically stroking the honing tool including a pneumatic system operative from a compressed air supply and including a double-acting piston in a cylinder having a piston rod with a variable stroke determining full stroking and short stroking of the honing tool, the improved pneumatic system comprising:

a control valve operatively connected to opposite ends of the cylinder and to the compressed air supply, and having a spool movable between a tool raising station whereat a first end of the cylinder is pressurized and the second end is vented, and a tool lowering station whereat said first end is vented and the second end is pressurized;

first and second air supply circuits to the control valve from the air supply;

a normally closed upper limit control valve in the first circuit caused to open when said piston rod is at a first limit of its travel corresponding to an upper stroke limit of the honing tool, and move the control valve from its tool raising station to its tool lowering station;

means in the second circuit for reducing the air pressure supplied by the second circuit to the control valve to a pressure less than the air pressure supplied by the first circuit to the control valve so that the spool will always move to the tool lowering station when the lower limit control valve is in closed position;

a normally open upper limit control valve in the second circuit caused to open when said piston rod is at a second limit of its travel corresponding to a lower stroke limit of the honing tool, and move the control valve from its tool lowering station to its tool raising station;

a normally short stroking dwell valve and a check valve in the second circuit and arranged in parallel relation to one another, the check valve preventing flow in the air supply direction;

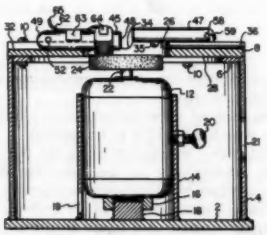
the valves in the second circuit being arranged so that opening of the short stroking dwell valve isolates compressed air in the second circuit between the control valve and the check valve and short stroking dwell valve whereby each time the lower limit control valve opens and vents the portion of the second circuit between the control valve and the lower limit control valve, the spool in the control valve responsively moves toward its tool raising station by way of said isolated compressed air in the second circuit.

4,550,531

GRINDING BOX

William L. Frey, 303 Ivory Avenue, Pittsburgh, Pa. 15214

Filed Dec. 19, 1983, Ser. No. 563,214
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—125 **8 Claims**



1. Apparatus for grinding bolt heads and nuts, said bolt heads and nuts each having a plurality of faces, said apparatus comprising:

(a) a housing, including a base, a sidewall and a cover, said cover being a flat plate having a top surface;

(b) abrading means disposed within the housing and beneath

the cover, said abrading means being a power driven abrading wheel having a top surface;

(c) an opening through the cover providing access to the abrading wheel, said abrading wheel being adjacent the opening and spaced below the top surface of the cover, and

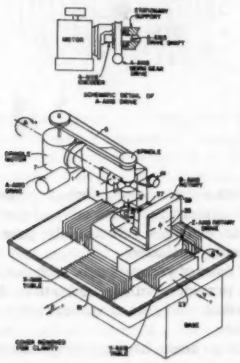
(d) bolt positioning means for positioning a bolt head against the abrading wheel and nut positioning means for positioning a nut against the abrading wheel such that the faces of the bolt heads and nuts are abraded and the bolt heads and nuts are reduced to a predetermined smaller size, said bolt positioning means being one or more channels in the cover which extend outwardly from the opening along the top surface of the cover, each of the channels having a bottom and being adapted to receive a threaded portion of a bolt of a particular size and position the corresponding bolt head against the top surface of the abrading wheel, whereby the bolt head is reduced to a smaller size as determined by the spacing between the bottom of the channel and the top surface of the abrading wheel, and said nut positioning means being a nut pilot shaft pivotally mounted to the top surface of the cover adjacent each channel and having means for positioning each nut pilot shaft within said adjacent channel, wherein the nut has a central opening through which the nut pilot shaft enters, said nut surrounding the nut pilot shaft, each nut pilot shaft having a size which will accept a nut corresponding to the size of the bolt which the adjacent channel is adapted to receive, and each nut pilot shaft adapted to be positioned within said adjacent channel and position the nut against the top surface of the abrading wheel, whereby the nut is reduced to a smaller size as determined by the spacing between the bottom of the channel and the top surface of the abrading wheel.

4,550,532

AUTOMATED MACHINING METHOD

George R. Fletcher, Jr., Central; George H. Messick, Jr., Clemson; Charles K. Roby, Clemson, and Cecil O. Huey, Jr., Clemson, all of S.C., assignors to Tungsten Industries, Inc., Greer, S.C.

Filed Nov. 29, 1983, Ser. No. 556,157
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—288 **5 Claims**



1. A process for producing a machined article from an elongated blank, comprising the steps of:

providing an apparatus which comprises:

a chuck for holding said elongated blank,

means for rotating said elongated blank about a B axis, said B axis providing rotation about the central axis of said blank,

means for rotating said chuck in a horizontal plane about a Z axis,

means for moving said said means for rotating said chuck about a Y axis in a horizontal plane,

means for moving said means for moving along said Y axis about an X axis in a horizontal plane which is perpendicular to said Y axis,

a generally circular cutting wheel,

means for rotating said cutting wheel about the center thereof,

means for rotating said cutting wheel about an A axis perpendicular to the axis of rotation of said wheel,

means for measuring movement along each of said A, B, X, Y, and Z axes;

rotating said cutting wheel about the center axis thereof;

rotating said cutting wheel about said A axis;

rotating said elongated blank about said B axis;

moving said blank along said X, Y, and Z axes so as to engage said blank with said cutting wheel;

measuring the movement along said A, B, X, Y, and Z axes;

generating signals representative of said measurement along said axes;

establishing predetermined desired geometrical ratios with regard to the desired configuration of the machined blank;

assigning specific dimensional measurements which relate to said ratios to establish absolute predetermined desired measurements;

transposing said desired ratios into movement along said A, B, X, Y and Z axes;

comparing said signals with predetermined desired signals representative of said predetermined desired geometrical ratios; and

generating desired paths of movement for all axes simultaneously to maximize utilization of all available axes;

controlling movement along all said axes simultaneously along said path.

4,550,533

AIR-SUPPORTED STRUCTURE FOR SPORT ACTIVITIES

Donato M. Fraioli, 884 Palmer Ave., Mamaroneck, N.Y. 10543

Filed Sep. 30, 1982, Ser. No. 431,553
Int. Cl.[4] E04B *1/345*
U.S. Cl. 52—2 **20 Claims**

1. An air-supported structure for use in housing sport activities such as a golf-driving range and the like comprising, a flexible, collapsible and inflatable sheet mountable in an anchored condition on a surface of an area prior to inflation thereof and when inflated in an anchored condition defining an air-supported structure with arcuate surfaces, said structure having at its base periphery, the configuration of a truncated triangle, said structure being symmetrical about a vertical plane of symmetry passing through the longitudinal axis and an arcuate longitudinal profile in which a front end of the structure corresponding to a larger base of the truncated triangle is lower than a rear end of the structure at a smaller base of said truncated triangle, the top of the structure extending upwardly from the front toward the rear at an increasing pitch along the major length of the structure to a substantially highest portion of the structure and rapidly curving downwardly at the rear toward its anchor area, the structure having a transverse sectional elevation profiles with a substantially arcuate convex

central area surface symmetrical about said plane of symmetry with symmetrical wing surfaces extending laterally therefrom curving downwardly away from the central portion.

4,550,534

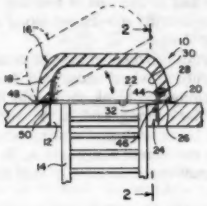
ATTIC STAIRCASE

Kenneth E. Mariano, c/o George Spector, 3615 Woolworth Bldg., and George Spector, 3615 Woolworth Bldg., both of 233 Broadway, New York, N.Y. 10007

Filed Aug. 23, 1983, Ser. No. 525,736

Int. Cl.⁴ E06C *9/06;* **E06B** *5/00;* **E04D** *13/035*

U.S. Cl. 52—19 **3 Claims**



1. A sealing cover for an attic floor well opening and attic stairs which comprises:

(a) a dome made of insulated material, covering the attic floor well opening, pivotable at one side to close and open the attic floor well opening;

(b) a seal made of weather stripping mounted around bottom edge of said dome;

(c) means for holding down said dome over the attic floor well opening and compressing said seal around perimeter of the attic floor well opening making said dome draft free; and

(d) means for raising up said dome from the attic floor well opening so that a person may gain access through the attic floor well opening via the attic stairs, wherein said means for holding down said dome over the attic floor well opening comprises:

(a) a flexible strap mounted on the dome inner surface with grip formed at bottom end and a transverse aperture near the handle thereof;

(b) a hook mounted in the attic floor well opening below said dome so that when said strap is stretched down via the hand grip handle said transverse aperture can be placed over said hook, wherein said means for raising up said dome from the attic floor well opening is a spring hinge mounted between the bottom edge of said dome and the attic floor opposite said strap so that when said strap is removed from said hook said spring hinge will pivot said dome to an open position, wherein said means for raising up said dome from the attic floor well opening further comprises:

(c) a leaf spring pivotally connected between a top center point within a groove in said dome and a second hinge on the attic floor.

4,550,535

COPING SYSTEM

Edward J. Drogosch, 27049 Grand River, Redford, Mich. 48240

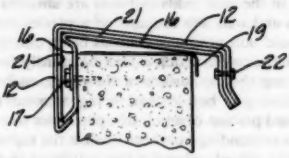
Filed Jul. 21, 1983, Ser. No. 515,792

Int. Cl.⁴ E04D *13/14;* **E04F** *19/02*

U.S. Cl. 52—60 **5 Claims**

1. A coping system covering a top of a wall comprising:

a substantially inverted U-shaped continuous cleat having an anchor leg secured to a first side of the wall and extending upwardly from the top of said wall, an interior leg disposed adjacent to a second side wall, a top leg extending substantially in a single plane between the anchor leg and interior leg, formed means interconnecting the anchor leg and the top leg at a location spaced upwardly from the top of said wall near the first side, said formed means comprises a reversely bent portion of said cleat having a flange portion extending at an oblique angle outwardly from the anchor leg at a point spaced upwardly from the top of the wall in a direction generally away from the first side of the wall, a bight being formed at the outermost point of the flange portion which contiguously interconnects the



flange portion to the top leg to form the reversely bent portion which biases the top leg toward the top of the wall when the cleat is installed thereon to hold the coping system firmly into engagement with the top of the wall adjacent the second side; and

a coping panel having an exterior face overlaying the anchor leg, a top face overlaying the top leg, an interior face overlaying the interior leg, and means for gripping the anchor leg being formed on said exterior face.

4,550,536

INDUSTRIAL BUILDING FRAMEWORK FORMED FROM PREFABRICATED REINFORCED CONCRETE ELEMENTS

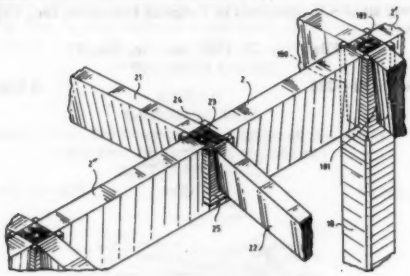
Jean F. Lamoure, 30, rue Montaigne, 47000 Agen, France

Filed Nov. 23, 1982, Ser. No. 444,017

Claims priority, application France, Nov. 23, 1981, 81 21902

Int. Cl.⁴ E04B *7/02*

U.S. Cl. 52—91 **4 Claims**



1. A framework for receiving a slanted roofing of a building, said framework comprising an assembly of prefabricated reinforced concrete elements substantially parallelepipedic in shape, said assembly including:

a plurality of pairs of vertical posts, each post comprising an upper end provided with a substantially horizontal supporting surface, said pair of vertical posts defining a first vertical plane;

a horizontal ridge beam, having a longitudinal axis, first and second vertical opposite faces and upper and lower horizontal opposite faces, and lower horizontal face bearing on said supporting surfaces of said posts and said horizontal upper face being provided with at least two transversal recesses perpendicular to said longitudinal axis and reinforcement bars incorporated in said horizontal beams and passing through said transversal recesses;

at least two slanted roof truss structures respectively extend-

ing in second and third spaced vertical planes perpendicular to said longitudinal axis, each of said roof truss structures comprising a first slanted half roof truss having a first upper extremity with a first upper substantially vertical face bearing on a first portion of said opposite face of said horizontal ridge beam, and a second slanted half roof truss comprising a second upper extremity with a second substantially vertical upper end face bearing on a second portion of the second opposite face of said horizontal ridge beam, said upper end faces of the first and second half roof trusses, each having an upper part located in front of one corresponding of said two recesses, said half roof trusses further comprising reinforcement bars incorporated therein, which have end portions extending beyond said respective upper parts into said corresponding recess, the two half roof trusses of each slanted roof truss structure being symmetrical relative to said first vertical plane;

connecting means for at least said end portions of the reinforcement bars of the first and the second half roof trusses, whereby the horizontal thrusts developed by the two half slanted roof trusses of each slanted roof truss structure produce both a counterbalanced pulling force on the corresponding reinforcement bars and a counterbalanced compressional force on the corresponding first and second portions of the horizontal ridge beam;

a protecting concrete forelock building up said recesses

a plurality of rectilinear horizontal stringers supported by said half roof trusses and extending parallel to said ridge beam.

4,550,537

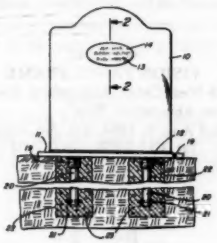
MONUMENTS FOR GRAVES

Wallace R. Smith, 76 University St., Portland, Me. 04103

Filed Jun. 16, 1983, Ser. No. 504,812

Int. Cl.[4] E04H *13/00*

U.S. Cl. 52—103 **1 Claim**



1. A monument for graves, said monument including a base and a head each of which consists of a single flat sheet of stainless steel the thickness of which is in the approximate range of five-eighths of an inch to two inches, the length and width of the base greater than the width and thickness of the head, a weld joining the head and the base and extending continuously about the head with said head normal to the base and so located that marginal portions of the base are exposed on both sides of and at both ends of the head, a concrete support in the ground in the ground in the form of a pair of tubular forms in the ground and of a diameter less than the width of the base and spaced lengthwise thereof, a body of concrete in each form, and said base including a connecting means depending from and secured to its undersurface and embedded and anchored in a selected one of said concrete filled forms in a manner such that the monument is installed with said base substantially flush with the ground surrounding the monument, whereby the wheels of a lawn mower may travel across marginal portions of the base while the mower is cutting grass at the edges thereof.

4,550,538

POOL AND METHOD OF MAKING SAME

Stanley R. Blakeway, Stafford, Australia, assignor to Blakeway Marviroll Pools Pty. Ltd., Queensland, Australia

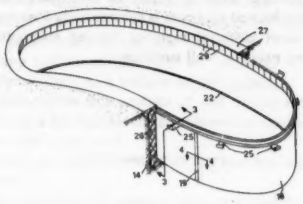
PCT No. PCT/AU82/00119, § 371 Date Mar. 1, 1983, § 102(e) Date Mar. 1, 1983, PCT Pub. No. WO83/00521, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 29, 1982, Ser. No. 474,580

Claims priority, application Australia, Jul. 29, 1981, PE9976

Int. Cl.[4] E04H *3/16*

U.S. Cl. 52—169.7 **6 Claims**



1. A method of making a liquid storage container including the steps of:

supporting an endless base strip with its upper edge substantially in a horizontal plane;

applying an endless former strip of resiliently deformable material about the base strip, the top of the former strip being above the top of the base strip;

applying concrete to embed therein the base and former strips, concrete inwardly of the base strip being substantially level with the top of said base strip, concrete outwardly of the former strip being above the level of the base strip;

removing the former strip after the concrete has set to form an endless groove of which the base strip forms the inside face;

inserting into said groove the bottom part of a container wall consisting of an endless loop of vertical sheet material; and

force-fitting a sealing strip of resiliently deformable material into said groove between the base strip and the inserted bottom part of said wall.

4,550,539

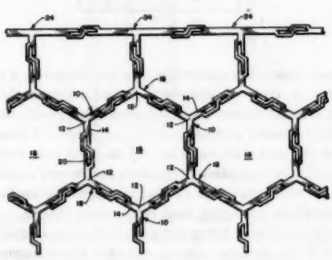
ASSEMBLAGE FORMED OF A MASS OF INTERLOCKING STRUCTURAL ELEMENTS

Terry L. Foster, 12716 Cijon St., San Diego, Calif. 92129

Filed Dec. 27, 1983, Ser. No. 565,391

Int. Cl.[4] E04C *1/30*

U.S. Cl. 52—236.1 **12 Claims**



1. An assemblage formed of a plurality of elongated structural elements, said assemblage comprising:

each said elongated structural element being constructed in

transverse cross-section of a hub from which extends a plurality of sheet material panels, each said panel having a free outer edge, said hub having a longitudinal center axis, each said panel substantially defining a plane, each said plane intersecting at said longitudinal center axis, said longitudinal center axis being totally confined within each said plane; and

interlocking means connected to each said panel directly adjacent said free outer edge, said interlocking means of one said panel to matingly engage with a said interlocking means of another said panel of a separate elongated structural element forming a pair of interlocked said panels, said interlocked said panels substantially forming a continuous sheet material member having substantially flush abutting exterior wall surfaces.

4,550,540

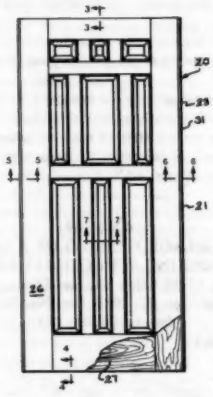
COMPRESSION MOLDED DOOR ASSEMBLY

John E. Thorn, Sylvania, Ohio, assignor to Therma-Tru Corp., Toledo, Ohio

Continuation-in-part of Ser. No. 456,400, Jan. 7, 1983, abandoned. This application Mar. 29, 1984, Ser. No. 594,549

Int. Cl.⁴ E06B *3/36*

U.S. Cl. 52—309.4 **13 Claims**



1. A door assembly comprising, in combination, a rectangular frame, a pair of opposed compression molded skins mounted on said frame, and a foamed core positioned within said frame between and adhered to said opposed compression molded skins, said skins each having an outer side and an inner side, a vertically extending projection positioned on each vertical edge of said inner side of said compression molded skins, said projections engaging said rectangular frame, said compression molded skins being integral, including a molding resin and glass fibers, said outside of said skin being essentially devoid of glass fibers for a predetermined depth of at least 0.005 inch, said outer side of said skin defining a textured pattern simulating the grain and texture of a wood door, said textured pattern having a pattern depth between 0.003 inch and 0.009 inch, but not in excess of such predetermined depth.

4,550,541

SCAFFOLDING

Joseph E. Whitlam, Barnsley, and Alwyn H. Richards, Pontefract, both of England, assignors to Stevecleave Limited, South Yorkshire, England

Continuation of Ser. No. 442,907, Nov. 19, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,190

Claims priority, application United Kingdom, Nov. 28, 1981, 8136001

Int. Cl.⁴ E04C *1/18*

U.S. Cl. 52—309.8 **16 Claims**

1. A scaffolding tube comprising: a hollow extruded aluminum tube of circular cross section with a uniform external diameter along the entire length thereof, the aluminum tube having an outer diameter in the range of about 4.70 to 5.08 cm, the aluminum tube also having a wall thickness in the range of about 0.38 to 0.51 cm and having a mean weight of aluminum in the range of about 1.488 to 1.789 Kg/m of the tube length, the interior of the aluminum tube being filled along the entire length thereof with a low density foam material to prevent jetting of the scaffolding tube when dropped into sea water, said foam material having a closed cell content of not less than about 90% to inhibit water from entering the scaffolding tube, and said foam material having a density selected to give the scaffolding tube positive buoyancy in sea water to eliminate the necessity of recovering the scaffolding tube from the sea bottom.

16. A scaffolding structure comprising: a plurality of scaffolding tubes, each scaffolding tube including an extruded aluminum tube of uniform size and shape along the entire length thereof, the interior of each aluminum tube being filled along the entire length thereof with a low density foam material to prevent jetting of the scaffolding tube when dropped into sea water, said foam material having a closed cell content of not less than about 90% to inhibit water from entering each scaffolding tube, said foam material having a density selected to give each scaffolding tube positive buoyancy in sea water to eliminate the necessity of recovering the scaffolding tube from the sea bottom, and detachable means that connects the scaffolding tubes to each other to form said scaffolding structure.

4,550,542

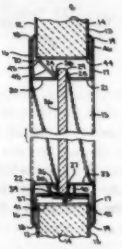
VISION PANEL FRAME

Jack La See, 308 West Cedar, Abbotsford, Wis. 54405, assignor to Jack La See, Abbotsford, Wis.

Filed Aug. 9, 1984, Ser. No. 639,066

Int. Cl.⁴ E06B *3/62, 1/04*

U.S. Cl. 52—476 **25 Claims**



1. A fire resistant vision unit for assembly in an opening in a door or the like comprising:

a first frame member adapted to be mounted in said opening to one side of said door;

a second frame member adapted to be mounted in said opening and to the opposite side of said door;

said first and second frame members having flange sections for extending over peripheral edges of said opening;

securing means clamping the first and second frame members to the door and to a transparent panel member

support arms extending toward each other from said first and second frame members into said opening and defining an open holding channel;

said transparent panel member disposed in said channel;

wherein said support arms maintain said panel in place including times when said panel becomes semi-molten said support arms including inwardly biased sharp edge portions in contact with said panel member wherein said sharp edge portions will imbed in said panel member when said panel becomes semi-molten and;

at least one support element positioned between said first and second frame members and closing the open channel to support the bottom of said panel member.

4,550,543

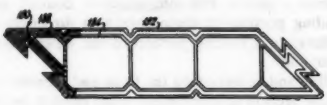
CONSTRUCTION FORMS

Marcello Valenzano, 154-09 33rd Ave., Flushing, N.Y. 11354

Filed Jan. 9, 1984, Ser. No. 569,040

Int. Cl.[4] E04C *1/39, 2/52*

U.S. Cl. 52—309.7 **4 Claims**



1. Prefabricated structural assembly composed of interconnected construction forms and comprising,

(a) standard construction forms in the form of shells having side walls and biased end terminations,

(b) extrudable shells disposed to fit within the said forms, said shells having separate cells and support members for the transmission of cables, fluids and other utility carriers, and

(c) solidifying means within the said forms between the said shells and forms to maintain their spaced relationship upon solidification of the said solidifying means.

4,550,544

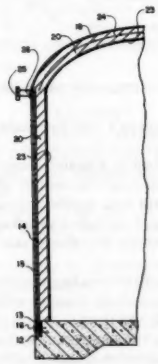
METHOD FOR FORMING STRUCTURES

Theodore T. Thoeny, 1054 Haviland Ter., Seaside, Calif. 93955

Filed Aug. 17, 1983, Ser. No. 523,887

Int. Cl.[4] E04B *1/34*

U.S. Cl. 52—741 **22 Claims**



1. A method for forming a structure comprising the steps of:

(a) Forming a foundation,

(b) Attaching panels to said foundation to form an assembled panel construction,

(c) Installing at least a door in said panels,

(d) Fabricating an unshaped flexible membrane having a middle portion and further having a peripheral portion,

(e) Draping said flexible membrane over the upper portion of said assembled panel construction, such that the middle portion of said membrane hangs down within said panel construction lower than the peripheral portion of said membrane, adjusting said membrane such that the draped mode of said membrane will be the reverse of the desired shape of the roof of the structure, thereafter attaching the peripheral portion of the membrane to the upper portion of the panel construction, and thereafter

(f) Inflating said membrane with air pressure,

(g) Applying foam to a surface of said panels,

(h) Applying foam to a surface of said membrane,

(i) Applying a fire barrier to the interior or exterior exposed side of said foam, and

(j) Applying an exterior sealant to any exterior exposed foam surfaces,

Whereby structures of various sizes and configurations can be constructed and modified without the necessity of an extensive structural framework.

4,550,545

VENTILATION INSET FOR SHIELDING CABINS AND ROOM SCREENING DEVICES

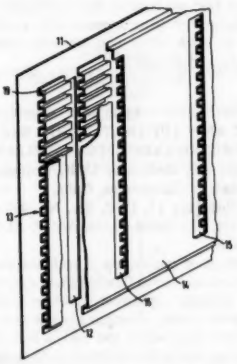
Hans-Werner Schulz, Wenzenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 497,811

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220287

Int. Cl.[4] E04C *2/32*

U.S. Cl. 52—799 **5 Claims**



1. Ventilation inset for shielded cabins and room screening devices, comprising mutually parallel and spaced apart adjacent metal sheets each having slots formed therein, said slots in each of said sheets being shifted relative to said slots in the next adjacent sheet, and a multiplicity of air-permeable waveguides disposed between each two adjacent sheets providing communication between the interior of the cabins and the surroundings.

4,550,546

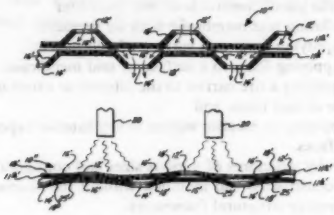
STERILIZABLE PERFORATED PACKAGING MATERIAL

Garland E. Raley, Terre Haute, Ind., and Richard W. Goodrum, Richmond, Va., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 423,956, Sep. 27, 1982, which is a continuation-in-part of Ser. No. 270,609, Jun. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 289,369, Aug. 3, 1981, abandoned. This application Sep. 17, 1984, Ser. No. 651,449

Int. Cl.[4] B65B *55/10*

U.S. Cl. 53—425 **19 Claims**



1. A method for sterilizing an item in a package comprising:

a. placing the item between a fiber-free top sheet and a fiber-free bottom sheet of a sterilizable package, which package comprises said top sheet connected at its edges to said bottom sheet, said sheets being made from a material comprising a first layer of perforated thermoplastic extruded film and a second layer of perforated thermoplastic extruded film, said second layer of said film connected to said first layer of said film, said first layer of said film and said second layer of said film each having protuberances therein in which the perforations are located, and said first layer of said film being oriented relatively to said second layer of said film so that said perforations in said first layer of said film are mis-aligned with said perforations in said second layer of said film;

b. subjecting said package to a stream of sterilizing gas sufficient to enter the interior of said package and sterilize the item inside; and thereafter,

c. subjecting said package to heat sufficient to seal the areas of said layers of film around said perforations in said package to each other and thereby make said package water-tight and airtight.

4,550,547

METHOD AND APPARATUS FOR ROLLING AND PACKAGING CONVOLUTED FOAM PADS

Bill L. Wagner, Sr., Redlands, Calif., assignor to Bio Clinic Company, Rancho Cucamonga, Calif.

Filed May 17, 1983, Ser. No. 495,600

Int. Cl.[4] B65B *11/56, 61/12, 63/02*

U.S. Cl. 53—430 **10 Claims**

1. In a method of packaging a rollable and compressable foam pad with a continuous flexible sheet material divided into a plurality of sections separated by transverse pre-weakened lines, the sections having a length greater than the circumference of the foam pads when the pad is in a rolled and compressed condition and a width greater than the length of the foam pad when the pad is in a rolled and compressed condition, the steps comprising:

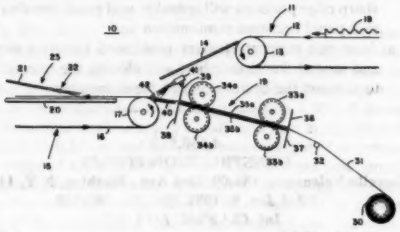
a. feeding the continuous flexible sheet material to a set of clutch-brake nip rolls;

b. engaging the clutch-brake nip rolls to feed the continuous flexible sheet material into a set of drive nip rolls;

c. guiding the flexible sheet material during its travel between the nips of the clutch-brake nip rolls and the drive nip rolls;

d. braking the clutch-brake nip rolls while the drive nip rolls are engaged in advancing the continuous flexible sheet material, so that a tension is exerted on the continuous sheet material sufficient to tear the sheet material along the transverse pre-weakened line and separate a single section from the length of the continuous sheet material;

e. synchronously feeding the foam pad, in a non-compressed condition, and the separated singie section in a predetermined direction and into adhesive contact such that a trailing portion of the pad in said direction of feeding adheres to a leading portion of the separated single section; and



f. rolling and compressing the foam pad thereby causing the single section to completely wrap around the exterior of the pad and maintain the pad in a rolled and compressed condition.

4,550,548

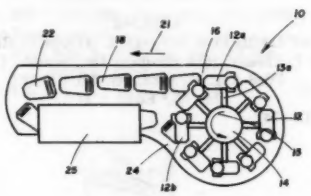
METHOD AND APPARATUS FOR VACUUM PACKAGING WITH PRESHRINKING

Joseph E. Owensby, Spartanburg; Jody W. Rupp, Buffalo; Frederick A. Dobbins, Lyman, and Thomas E. Waldrop, Greer, all of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed May 26, 1983, Ser. No. 498,426

Int. Cl.[4] B65B *31/00, 51/32, 53/06*

U.S. Cl. 53—434 **6 Claims**



1. A method for continuously packaging products comprising:

(a) placing a product in a heat shrinkable thermoplastic bag; then

(b) shrinking said bag in a heated gaseous medium while

(c) partially constricting the mouth of said bag to cause ballooning of said bag, further provided that said constricting is selected such that shrinkage of said bag overcomes said ballooning to collapse said bag onto said product;

(d) cooling the mouth of said bag during said constricting of the mouth sufficiently to prevent self-welding of the bag material to itself; and then

(e) placing said bag in a vacuum chamber followed by vacuumizing and in-chamber sealing, further provided that the rate of vacuumizing is limited to substantially prevent ballooning of said bag.

2. Apparatus for continuously vacuum packaging a product, comprising:

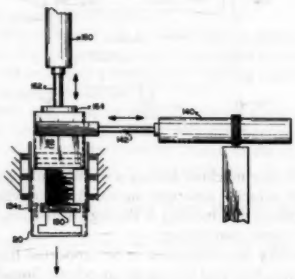
(a) means for shrinking a heat shrinkable thermoplastic bag in a heated gaseous medium; having associated therewith
(b) means for partially constricting the mouth of said bag to cause ballooning of said bag, further provided that said constricting is selected such that shrinkage of said bag overcomes said ballooning to collapse said bag onto said product;
(c) means for cooling the mouth of said bag in conjunction with said constricting means; and,
(d) a vacuum chamber, separate from said shrinking means, having means for vacuumizing and in-chamber sealing further provided that the rate of vacuumizing is limited to substantially prevent ballooning of said bag.

4,550,549

APPARATUS AND METHOD OF PACKING ARTICLES

Nyles V. Reinfeld, P.O. Box 2321, Bath, Ohio 44210, and Michael J. Valentine, 78 Tower Rd., Pines Lake, Wayne, N.J. 07470

Continuation-in-part of Ser. No. 443,354, Nov. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 338,440, Jan. 11, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,877
Int. Cl.⁴ B65B *43/00, 35/50*
U.S. Cl. 53—447 **18 Claims**



1. A method of packing articles in a container comprising the steps of:
forming articles into stacks of different heights but of substantially constant cross-sectional shape and area in a temporary retainer, measuring the heights of the stack of articles,
after measuring the height of the stacks, molding an open-ended container of a length to receive said articles as stacked, and
telescoping said newly molded container over said articles to enclose the same.

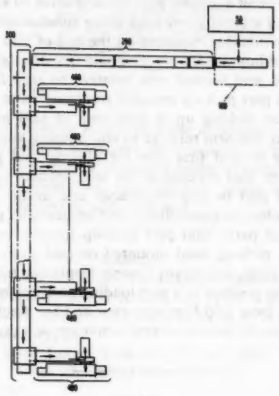
4,550,550

AUTOMATED MINERAL WOOL ROLL-UNIT PROCESSING SYSTEM

Peter T. Scott, Bogart, Ga., assignor to CertainTeed Corporation, Valley Forge, Pa.

Filed Mar. 31, 1983, Ser. No. 480,941
Int. Cl.⁴ B65B *1/24*
U.S. Cl. 53—529 **8 Claims**

4. An automated system for processing insulation roll units of different facings and widths for packaging comprising:
a. receiving means located adjacent a production line for receiving a roll-set from the production line, and orienting said set for a desired placement of end tabs thereof;
b. roll-set breaking means located adjacent said receiving means for receiving a set of a plurality of separable but connected-together roll units and for separating said set into a plurality of individual roll units;
c. verifying means located downstream of said roll-set breaking means for verifying preselected characteristics of said units;
d. delivery means located downstream of said roll-set breaking means for conveying roll units to a packaging station while maintaining desired predetermined orientations of the units to deliver them for packaging, each under a predetermined packaging orientation; and
e. at least one packaging means located downstream of said verifying means and delivery means for packaging rolls with end tabs thereof in predetermined orientation,



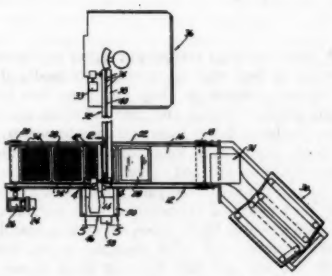
wherein said receiving means includes cradling means located at a first upper position for releasably grasping said set therebetween and connected to a first drive means for rotating said set to a preselected final position while maintaining said set above a predetermined level, wherein said receiving means includes conveyor means connected to a second drive means and located at a first lower position for engaging said set and releasably transporting said set away from said receiving means, wherein said conveyor means includes rejection means for ejecting a defective roll set backwards out of said receiving means.

4,550,551

SAGGER LOADER AND CONVEYOR APPARATUS AND METHOD

Raymond P. DeSantis, 2710 Timberwyck Trail, Troy, Mich. 48098

Filed Feb. 9, 1983, Ser. No. 465,166
Int. Cl.⁴ B65B *5/08, 5/10;* B65G *47/52*
U.S. Cl. 53—534 **13 Claims**



1. An apparatus for transferring parts, comprising a first

conveyor for carrying a single row of parts and travelling along a first axis of travel, a second conveyor having a receptable thereon and travelling along a second axis of travel at an angle to said first axis of travel, said receptacle for carrying parts placed therein in consecutive rows of a predetermined plurality of said parts, a stationary housing disposed at a location where said first axis of travel and said second axis of travel intersect, an elbow-joint arm supported by said housing and pivotable relative to said housing, said elbow-joint arm having a first arm pivotable around a single pivot axis relative to said housing and a second arm mounted on the end of said first arm pivotable around a second pivot axis relative to said first arm, said first and second pivot axes being substantially parallel, a part pick-up member mounted on the end of said second arm, means in said housing for pivoting said first arm relative to said housing and said second arm relative to said first arm for placing said part pick-up member over said parts on said first conveyor for picking up at least one of said parts and for pivoting said first arm relative to said housing and said second arm relative to said first arm for placing said part pick-up member over said receptacle on said second conveyor for placing said part in said receptacle, and means in said part pick-up member for controllably and sequentially grasping and releasing said parts; said part pick-up member comprising a slide, a part pick-up head mounted on said slide, means supporting said slide, and means linearly displacing said slide from a part pick-up position to a part loading position for picking up a single part from said first conveyor and for placing said part in said receptacle on said second conveyor at a predetermined location in a row.

4,550,552

SUGAR CANE HARVESTING METHOD AND APPARATUS

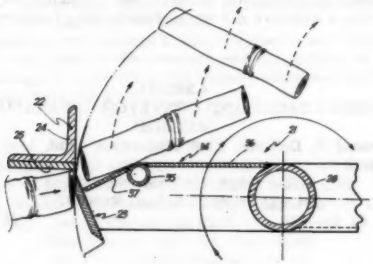
Rodney A. Stiff, Bundaberg, Australia, assignor to Toft Bros. Industries Ltd., Bundaberg, Australia

Continuation of Ser. No. 64,437, Aug. 7, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,544

Claims priority, application Australia, Aug. 16, 1978, PD5515

Int. Cl.[4] A01D *45/10*

U.S. Cl. 56—13.9 **8 Claims**



1. A cane harvester comprising cutter means to cut cane, feed means to feed said cut cane longitudinally along a feed path, chopping means to chop said cane into billets, billet engaging means to engage said cane and billets and a discharge chute to discharge billets from said cane harvester, said chopping means comprising longitudinal movable blade means rotatable about an axis and operable to sweep a substantially cylindrical or frusto-conical path, fixed blade means mounted on said feed path and cooperating with said movable blade means, said movable blade means movable upwardly past said fixed blade means, said billet engaging means being located between said axis and said movable blade means and being rotatable with said movable blade means, said billet engaging means being operable to engage and pretension said cane prior to said cane being cut into billets and to throw said cut billets upwardly and away from said chopping means into said discharge chute.

4,550,553

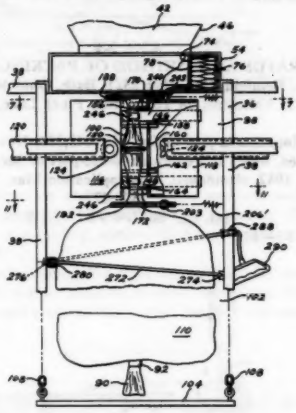
PLASTIC SHEET TUBING, BAG-FORMING APPARATUS FOR LAWN MOWERS

John L. Gaither, Louisville, Ky., assignor to Richard L. Caslin, Louisville, Ky.

Filed Oct. 20, 1983, Ser. No. 543,615

Int. Cl.[4] A01D *53/06*

U.S. Cl. 56—202 **25 Claims**



1. A lawn care machine having a mobile main frame which carries high velocity airstream means for removing material from the ground and moving it through a discharge opening, the improvement comprising:

a. an auxiliary frame adapted to be supported from the rear of said machine and having an air-release funnel section at the top of this frame for receiving the delivery of material from the said discharge opening and separating out much of the airstream from the material, the lower end of the funnel section having a discharge opening through which the material falls;

b. a supply of large plastic sheet tubing that is folded lengthwise into a compact annular cartridge that is arranged horizontally beneath the discharge opening of the funnel section;

c. a plastic bag supporting platform positioned at the bottom of the auxiliary frame for supporting a plastic bag after it is formed from the plastic sheet tubing and filled by the removed ground material;

d. whereby the leading edge of the said supply of large plastic sheet tubing is first sealed to create the bottom of a plastic bag, so that as the ground material passes through both the funnel section and the annular cartridge the plastic bag is being filled causing it to pay out from the cartridge and pass downward by gravity due to its increasing weight and volume until the bag comes to rest on the said supporting platform;

e. a throttle section positioned beneath the cartridge of plastic sheet tubing comprising double-acting means for collapsing the empty top of the filled plastic bag while in place into a generally flat plane, as well as applying a collapsing force at the opposite ends of this generally flat plane to gather the plastic sheet tubing into a rope-like formation, and a pair of vertically-spaced sealing means for sealing the plastic rope-like formation at two locations, and cutter means for severing the rope-like formation at a location between the two sealed locations so as to seal

both the top of the filled plastic bag and seal the bottom of the next bag to be formed;

f. and remote control means for operating the said throttle section of the auxiliary frame to effect the collapsing operation of the top of the bag, as well as for operating the two sealing means, and operating the cutter means;

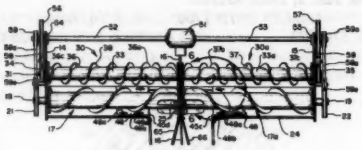
g. and remote control means for unloading the sealed bag from the supporting platform.

4,550,554

CROP PROCESSOR

E. Cordell Lundahl; James G. Wiser, both of Logan; W. Ray Thornley, Hyde Park, and Laurel H. Jensen, Hyrum, all of Utah, assignors to Ezra C. Lundahl, Inc., Logan, Utah

Filed Jan. 3, 1984, Ser. No. 567,661
Int. Cl.⁴ A01D *55/20, 49/00*
U.S. Cl. 56—294 **6 Claims**



1. A crop processor comprising

a support frame adapted to be coupled to a prime mover;

at least one elongate cutting auger journalled by said support frame and including a central shaft having a helical flange extending therearound;

cutting teeth spaced along and cut into the outer peripheral edge of the helical flange and with the outermost edge of each tooth extending from the flange in the direction of travel of the crop cut by the teeth and carried by the helical flange;

means for rotating the cutting auger about its longitudinal axis;

roller means on the frame for traveling the frame over the ground;

means to hold the cutting auger a selected distance off the ground and with its longitudinal axis substantially normal to the direction of travel of the frame;

cover means to direct crop cut by the cutting auger to a rear discharge location and to bend crop to have stalks thereof cut by the cutting auger;

a towbar connected to and projecting from the frame to connect to the drawbar of a towing prime mover;

crop pick up by means carried by the frame and positioned to be between each cutting auger and wheels of the prime mover, said crop pick up means including

support shafts fixed to the frame, and a wheel carried by each support shaft,

flexible fingers radiating from the periphery of each wheel to engage the ground during rotation of such wheel, and

means carried by the frame to rotate the wheel whereby the fingers sweep the ground in a plane traverse to direction of travel of the prime mover and raise crop knocked down by the wheels to be bent by the housing.

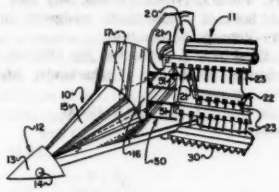
4,550,555

CROP GUIDING ATTACHMENT FOR A COMBINE DIVIDER

John W. Roblik, R.R. 1, Box 75, Vesta, Minn. 56292

Filed Aug. 2, 1984, Ser. No. 636,975
Int. Cl.⁴ A01D *63/00*
U.S. Cl. 56—314 **7 Claims**

1. A crop guiding attachment for a crop divider of the type used on a harvester having a transverse frame and reel, said crop divider extending forward from a relatively wide rear end to a relatively narrow snout, said attachment comprising crop guiding tines and means for mounting said tines to the rear end of said divider to extend laterally inward toward the center of the header for deflecting crops travelling along the inside of the sidewall toward the center of the reel whereby end wrap is prevented, each of said tines formed from resilient metal rod



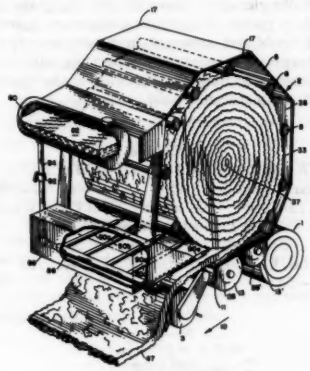
bent to form an annular spring near the mounting end thereof, said spring providing a resilient flexure point permitting said tines to move temporarily rearward under extreme crop-load conditions and permitting said tines to move temporarily downward if interfering with said reel.

4,550,556

SYSTEM FOR INJECTION OF LIQUID OR GRANULAR MATERIAL INTO A ROUND HAY BALE

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Jun. 4, 1984, Ser. No. 617,251
Int. Cl.⁴ A01D *39/00, 75/00*
U.S. Cl. 56—341 **7 Claims**



1. In a round baler of the type including a housing, running gear for supporting the baler in a field and for pulling the baler through the field, bale forming means cooperative with the housing, bale discharge means for discharge of a formed bale from the housing, and a pick-up assembly for directing material to be baled into bale forming means, said pick-up assembly including means for feeding a layer of material from field level into the bale for forming a round bale, said layer having a transverse dimension, the improvement in combination of:

a hold down assembly for the means for feeding material into the baler, said hold down assembly comprising a plurality of hollow tines positioned against the top of the layer as the layer enters the baler, said tines being directed toward the flow of material into the baler, said hold down assembly further comprising a manifold tube transverse to the layer, said hollow tines being connected from the manifold for simultaneously holding the top side of the layer and for dispersing liquid or particulate matter on and into the layer prior to forming the layer into a round bale, each

of said hollow tines including at least one ejector outlet for said liquid or particulate matter.

4,550,557

DEVICE TO FORM CROP INTO ROUND BALES

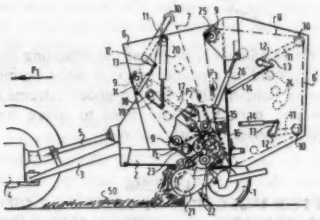
Hermanus H. Vissers, Nieuw-Vennep, and Jan Wondergem, Rijsenhout, both of Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed May 2, 1984, Ser. No. 606,246

Claims priority, application Netherlands, May 9, 1983, 8301647

Int. Cl.[4] A01D *39/00*

U.S. Cl. 56—341 19 Claims



1. A device for forming crop lying on the ground into a round bale mainly comprising a frame movable across the field and having two relatively spaced walls, a group of guiding and stretching members arranged between and supported by said walls for guiding and stretching respectively one or more endless belt-like elements, means for picking up the crop from the ground, a group of supporting members journalled between said walls and arranged in a substantially complete circle, said supporting members cooperating with said endless belt-like elements to limit the diameter of the round bale in accord with the diameter of said circle.

4,550,558

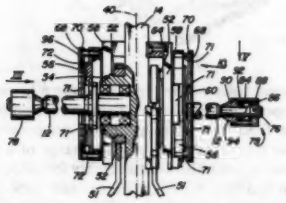
CRADLE FOR A TWISTING MACHINE

Jean Bouffard, Lachine; André Dumoulin, Montagnes, and Edgar K. Lederhose, Chateauguay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 565,743

Int. Cl.[4] B65H *59/04;* D01H *7/44, 7/86*

U.S. Cl. 57—58.52 6 Claims



1. A cradle for a twisting machine comprising

a reel spindle for supporting a reel of filamentary material in a reel support position upon the spindle,

the spindle rotatably mounted upon a support and having a free end,

an annular braking member surrounding and secured to the spindle,

means to apply a braking force to the braking member and thus to the spindle,

friction engaging means rotatable together with and about the axis of the spindle, for frictional engagement with the reel, said friction engaging means having a friction surface facing towards the free end of the spindle, and

resiliently compressive means to urge the friction surface towards the free end of the spindle, and

means for urging a reel when mounted upon the spindle against the friction surface

to urge the friction engaging means against the resiliently compressive means

to positively drivably couple the reel with the spindle and the braking member.

4,550,559

CABLES AND PROCESS FOR FORMING CABLES

Ian M. Thomson, Wokingham, England, assignor to Cable Belt Limited, Edinburgh, Scotland

Filed Sep. 1, 1983, Ser. No. 528,439

Claims priority, application United Kingdom, Sep. 1, 1982, 8224956; Jun. 2, 1983, 8315181

Int. Cl.[4] D07B *1/08, 1/10, 1/16, 7/14*

U.S. Cl. 57—223 25 Claims

1. A cable comprising:

at least one layer of strands twisted together,

each strand of said at least one layer being of circular cross-section and being formed of a plurality of elements twisted together,

each strand of said at least one layer being covered with an individual sheath of a plastics or rubber material,

at least some of said individual sheaths being of non-circular cross-section prior to the twisting of said at least one layer such that the sheaths of adjacent strands interlock to provide a layer in which the sheaths provide the circular strands with a generally fixed spatial relationship both to each other and within the cable.

4,550,560

METHOD FOR PIECING FASCIATED YARN

Akira Tanaka, Kariya; Takahiko Tsunekawa, Aichi; Kazuo Seiki, Kariya, and Haruyoshi Nakamura, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Mar. 26, 1984, Ser. No. 593,633

Claims priority, application Japan, Mar. 30, 1983, 58-52508; Mar. 30, 1983, 58-52509; Apr. 15, 1983, 58-65605; Oct. 8, 1983, 58-187696

Int. Cl.[4] D01H *15/00*

U.S. Cl. 57—261 15 Claims

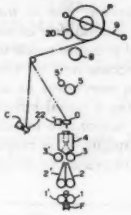
1. A method for piecing a yarn in a fasciated yarn spinning unit, said unit comprising a drafting means for delivering a fiber bundle and an air nozzle for receiving said delivered fiber bundle and twisting it therein by a vortex to form a fasciated yarn, comprising steps of:

a1. stopping said delivery of said fiber bundle to said air nozzle;

a. displacing said air nozzle from a normal spinning position to a threading position such that a space exists in front of an inlet of said air nozzle;

b. guiding a yarn to be pieced to an outlet of said air nozzle;

c. applying a suction force through said inlet of said air nozzle to said outlet by a displaceable suction means, whereby the yarn is sucked into said suction means through said air nozzle;



d. returning said air nozzle from the threading position to the normal spinning position; and

e. resuming the delivery of said fiber bundle to said air nozzle, whereby said fiber bundle and said yarn to be pieced are united.

4,550,561

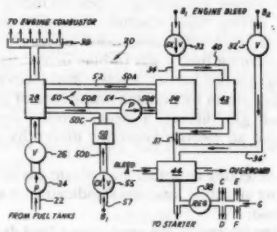
METHOD FOR IMPROVING THE FUEL EFFICIENCY OF A GAS TURBINE ENGINE

George A. Coffinberry, West Chester, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 132,364, Mar. 20, 1980, Pat. No. 4,404,793. This application Aug. 30, 1982, Ser. No. 413,101

Int. Cl.⁴ F02C *6/08*

U.S. Cl. 60—39.02 **4 Claims**



1. A method of recovering heat in a gas turbine engine which drives a fan in an aircraft, comprising:

(a) tapping a first compressor bleed airstream, B1, having a first temperature;

(b) tapping a second compressor bleed airstream, B2, having a second temperature higher than the first temperature;

(c) transferring heat from B1 through a first heat exchanger and into an aquaeous heat transfer medium;

(d) transferring heat from the aqueous medium of (c) into high-pressure fuel having a pressure exceeding 500 psig;

(e) bypassing some of B1 past the first heat exchanger of (c) when the temperature of the fuel of (d) reaches a predetermined level to thereby reduce heating of the high-pressure fuel;

(f) mixing B2 with both the B1 which passed through the first heat exchanger and with the B1 which bypassed the first heat exchanger in order to provide a mixed airstream; and

(g) directing some of the mixed airstream of (f) to one or more of the following engine suport components: wing anti-icer, cowl anti-icer, cabin air conditioner, or engine starter for absorption of heat from the mixed airstream prior to the overboard disposal of any significant amounts of B1 or B2 or the mixed B1 and B2 of (f).

4,550,562

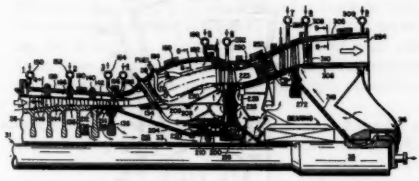
METHOD OF STEAM COOLING A GAS GENERATOR

Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, and a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, which is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953, said Ser. No. 274,660, is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442. This application Sep. 9, 1982, Ser. No. 416,173

Int. Cl.⁴ F02C *7/143, 7/16*

U.S. Cl. 60—39.02 **9 Claims**



1. In a method of producing work in a gas generator, said gas generator including a gas compressor, a combustor downstream of said compressor and a gas turbine downstream of said combustor, compressing ambient air by means of rotating blades within said compressor, igniting a combustible fuel in the presence of said compressed air in said combustor to form an exhaust gas and expanding said exhaust gas through the blading of said gas turbine, said compressor comprising an outer shell confining said rotating blades, and further controlling the tip clearance of at least a portion of said rotating blades relative to said outer shell by passing a controlled amount of coolant in heat exchange relationship with said outer shell to shrink or expand said outer shell, the improvement comprising; wherein said outer compressor shell comprises hollow steam chambers contained therein and an inner casing in contact with said compressed air and an outer casing annularly spaced from said inner casing, controlling the blade-tip clearance of said rotating blades within said outer compressor shell by passing coolant steam through said hollow steam chambers to provide heat exchange with said compressor shell to shrink or expand said compressor shell and further directing air or steam as a thermal barrier in said annular space between said inner and outer casings of said compressor shell.

4,550,563

GAS TURBINE COMBUSTION SYSTEM UTILIZING RENEWABLE AND NON-CRITICAL SOLID FUELS WITH RESIDUE REMOVER TO MINIMIZE ENVIRONMENTAL POLLUTION

William C. Marchand, 11339 Roxbury, Detroit, Mich. 48224

Continuation of Ser. No. 393,978, Jun. 30, 1982, abandoned, Division of Ser. No. 96,760, Nov. 23, 1979, Pat. No. 4,338,782. This application Aug. 17, 1984, Ser. No. 642,728

Int. Cl.⁴ F02C *3/26*

U.S. Cl. 60—39.06 **16 Claims**

1. A method for burning pulverized solid fuel with oxidizing fluid and for removing solid residues from the products of combustion, said method comprising the steps of:

introducing pulverized solid fuel into a fuel injector mounted to a combustor;

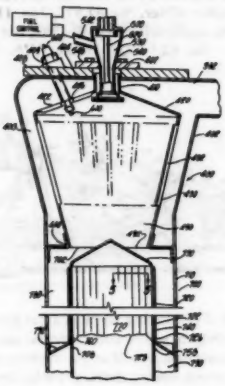
grinding and metering said pulverized solid fuel in said fuel injector to a ground pulverized solid fuel of a predetermined particle size;

injecting said ground pulverized solid fuel along a plane substantially radial of said fuel injector into a combustion chamber in said combustor, said injecting of said ground

pulverized solid fuel further imparting a tangential velocity component to said solid fuel within said radial plane as said ground pulverized solid fuel exits said fuel injector;

introducing swirling preheated oxidizing fluid into said combustion chamber such that swirling preheated oxidizing fluid crosses said radially injected ground pulverized solid fuel in said combustion chamber;

mixing said injected ground pulverized solid fuel with said swirling preheated oxidizing fluid to form a swirling combustible mixture in said combustion chamber;



igniting said swirling combustible mixture in said combustion chamber to form swirling gaseous products of combustion in said combustion chamber and solid residues suspended in said swirling gaseous products of combustion;

passing said swirling gaseous products of combustion and solid residues along an inertia separator; and

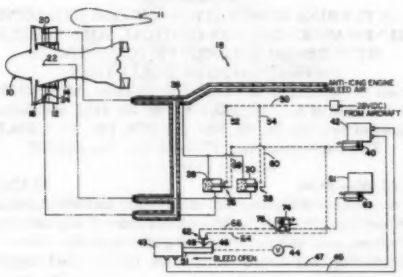
separating said solid residues from said swirling gaseous products of combustion in said inertia separator.

4,550,564

ENGINE SURGE PREVENTION SYSTEM

David J. Callahan; Robert S. Mazzawy; Howard Y. Stryker, all of Glastonbury, Conn., and James B. Kelly, Lake Worth, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 19, 1984, Ser. No. 590,661
Int. Cl.⁴ F02C 9/00
U.S. Cl. 60—39.093 **14 Claims**



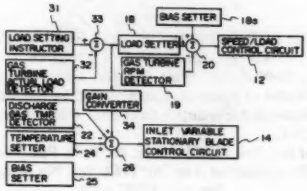
1. A surge control system for a fan jet engine for powering aircraft, said aircraft having independent means for detecting aircraft stall, said engine having a fuel control, including compressor speed control means, for controlling the thrust generated by said engine, said compressor having means, including a bleed valve and actuator therefor, for bleeding air from said compressor, a fan discharge duct housing said fan, the surge control system including at least a pair of total pressure probes circumferentially spaced and mounted in said duct and disposed so that one of said three pair of total pressure probes is in a predetermined location that is insensitive to pressure changes occasioned by a condition of said engine going into surge and the other total pressure probe is sensitive to pressure changes in said duct occasioned by said engine going into surge, computing means responsive to said pair of total pressure probes for producing a signal indicative of an imminent surge condition, means responsive to said signal for opening said bleed valve and simultaneously resetting said compressor speed control means to increase the thrust being generated by said engine.

4,550,565

GAS TURBINE CONTROL SYSTEMS

Jiro Ozono, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 16, 1984, Ser. No. 571,068
Int. Cl.⁴ F02C 6/18, 9/20
U.S. Cl. 60—39.182 **5 Claims**



1. A gas turbine control system comprising:

an electric power generating system including an air compressor having inlet variable stationary blades, a fuel burner supplied with compressed air from said compressor for burning fuel, a gas turbine driven by combustion gas from said fuel burner, a waste heat recovery boiler for generating steam by utilizing waste heat of gas exhausted from said gas turbine, a steam turbine driven by said steam, and an electric generator driven by said gas turbine;

means for detecting an actual load of said gas turbine and for producing an actual load signal indicative of said detected actual load;

a load setting instructor for producing a load demand signal;

first comparator means for determining a difference between said actual load signal and said load demand signal and for producing a first difference signal indicative of said determined difference;

means for detecting a speed of said gas turbine and for producing a speed signal indicative of said detected speed;

second comparator means for determining a second difference between said first difference signal and said speed signal and for producing a second difference signal indicative of said second difference;

a speed/load control circuit responsive to said second difference signal for controlling a quantity of fuel supplied to said burner;

a temperature detector for producing a signal representing a temperature of gas discharged from said gas turbine;

a temperature setter for setting the temperature of exhaust gas of said gas turbine and producing an output indicative of said set temperature;

third comparator means for comparing said output of said temperature setter, said first difference signal, and said signal produced by said temperature detector, and for producing an output indicative of the results of said comparison; and

an inlet variable stationary blade control circuit inputted

with said output of said third comparator means for controlling a degree of opening of said input variable stationary blades.

4,550,566

BRAKE MASTER CYLINDER

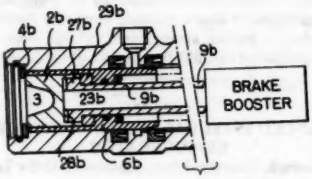
Juan S. Bacardit, Juan C. Coll, and Joaquim F. Bofill, all of Barcelona, Spain, assignors to Bendiberica, S.A., Barcelona, Spain

Division of Ser. No. 283,391, Jul. 15, 1981, abandoned. This application Mar. 7, 1984, Ser. No. 586,644

Claims priority, application Spain, Jul. 30, 1980, 494,695

Int. Cl.[4] B60T *13/20*

U.S. Cl. 60—554 **9 Claims**



1. A brake master cylinder to be coupled at one end to a brake booster, including a body formed with a longitudinal bore within which is movably received at least one annular master cylinder piston, an assisting pull rod to be actuated by said booster slidably extending through said piston and having an end portion opposite said one end of said master cylinder and formed with an outwardly radially extending flange member, an elastomeric annular reaction member arranged around said pull rod and interposed between said flange member and said piston, a push member slidingly arranged within the other end of said master cylinder adjacent said piston and connectable to a brake actuating member, said push member forming a cavity having a bottom facing said end portion of said pull rod and a peripheral edge, said flange member being received within said cavity, said peripheral edge and said flange member adapted for bearing engagement with said elastomeric annular reaction member, and said piston movable by both said pusher member and by said pulling rod via said elastomeric annular reaction member.

4,550,567

TANDEM MASTER CYLINDER FOR HYDRAULICALLY OPERATED VEHICULAR BRAKES

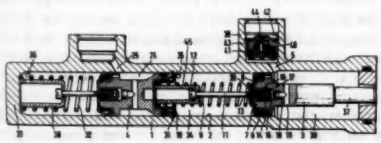
Ernst-Dieter Schaefer, Pliezhausen, Fed. Rep. of Germany, assignor to ITT Industries Incorporated, New York, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,764

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241881

Int. Cl.[4] B60T *11/20*

U.S. Cl. 60—562 **3 Claims**



1. A tandem master cylinder for use in a hydraulically operated brake system for a vehicle in which said cylinder comprises a housing having an elongated axial bore therein, a master cylinder piston and an intermediate piston axially aligned in said bore and spaced within said housing,

an individual restoring spring for each piston, each such spring at one end bearing against one face of the respective piston, an individual spring support for the opposite end of each spring secured in a fixed axial location to said housing,

a valve mechanism in the one face of each piston for providing a communication therethrough to an output chamber adjacent the one face of the respective piston within said bore with its respective piston in its at rest condition, each valve mechanism including a valve seat in the respective piston and a displaceable valve body,

an individual clamping element for positioning and aligning each restoring spring with each clamping element affixed to and carrying the respective valve body of the mechanism in the one face of the respective piston,

each said clamping element engaging the spring support for the respective spring to position the valve body carried by that clamping element relative to the fixed axial location on the housing to prevent displacement of each valve body from its at rest position at less than predetermined operating pressures in the respective output chambers of said cylinder bore, and

wherein said spring support for supporting said master piston restoring spring includes a central bore through which a stop sleeve extends fixed to said master piston clamping element and supported on the one face of said intermediate piston.

4,550,568

DIESEL INTERNAL COMBUSTION ENGINE

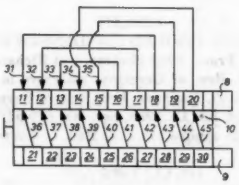
Herbert Deutschmann, Friedrichshafen, and Gerd-Michael Wolters, Markdorf, both of Fed. Rep. of Germany, assignors to MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,784

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322168

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—612 **6 Claims**



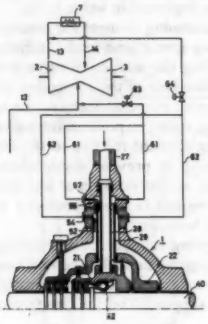
1. A diesel internal combustion engine, with low compression ratio and which is charged by an exhaust gas turbocharger, comprising a plurality of cylinders, at least one of said plurality of cylinders being operated as an engine cylinder during starting and partial load operation, said engine cylinder being charged by another cylinder of said plurality of cylinders operated as a compressor, the piston of the cylinder operated as a compressor leading the piston of the engine cylinder in a manner such that the engine cylinder is charged directly by the cylinder operated as a compressor by way of a connecting line, and the engine cylinder being additionally charged by a further cylinder of said plurality of cylinders operated as a compressor.

4,550,569

MAIN STEAM INLET STRUCTURE FOR STEAM TURBINE

Hitoshi Isa; Ryoichi Kaneko, and Katsuto Kashiwahara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,533
Claims priority, application Japan, Jun. 10, 1983, 58-102631
Int. Cl.⁴ F01K *19/00*
U.S. Cl. 60—657 **11 Claims**



1. A main steam inlet structure of a steam turbine provided with a turbine rotor with a plurality of blades, an inner casing which has nozzles and diaphragms with stationary blades in the interior thereof, and an outer casing surrounding the inner casing with a spacing for exhaust steam therebetween, which comprises:

a first inlet tube connected to said inner casing at one end thereof and at the other end to said outer casing for introducing main steam into said nozzles therethrough; and

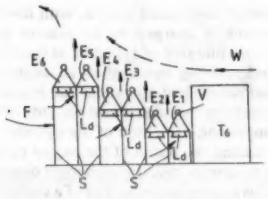
a second inlet tube, surrounding said first inlet tube with a spacing therebetween, connected to said outer casing at one end thereof and at the other end to said inner casing, said spacing between said first and second inlet tubes forming a first cooling passage communicating with an intermediate stage of the turbine for passing steam extracted from said intermediate stage through thereby cooling said first inlet tube, said extracted steam being lower in temperature and pressure than the main steam in said first inlet tube and higher than steam exhausted from the turbine.

4,550,570

FORCED-AIR COOLED CONDENSER SYSTEM

Burghard Trage; Franz-Josef Hintzen, and Richard Leitz, all of Ratingen, Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,631
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3325054
Int. Cl.⁴ F28B *1/06*
U.S. Cl. 60—693 **6 Claims**



1. In a forced-air cooled condenser system having a plurality of roof-shaped heat exchange elements of finned tubes, to which cooling intake air is fed via fans, and to which steam which is to be condensed is fed via steam distribution lines, each of which forms a ridge of a given one of said heat exchange elements; the heat exchange elements are disposed directly by a turbine housing, and are disposed next to one another or consecutively, with the ridges of said heat exchange elements being disposed parallel to one another;

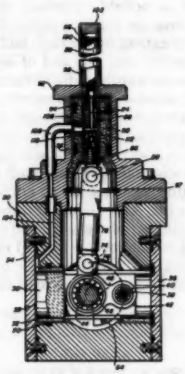
the improvement therewith which comprises having that heat exchange element, which is spaced the furthest from said turbine housing, arranged structurally higher than the heat exchange elements located therebetween so that, on one hand, in-flow losses of intake air can be reduced thereby having a favorable effect upon power required for cooling, and on the other hand, considerably reducing danger of recirculation of warmed air from the heat exchange elements due to inclined upwardly directed direction due to higher arrangement of that heat exchange element spaced furthest from said turbine housing.

4,550,571

BALANCED INTEGRAL STIRLING CRYOGENIC REFRIGERATOR

Peter K. Bertsch, Harvard, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Dec. 28, 1983, Ser. No. 566,212
Int. Cl.⁴ F25B *9/00*
U.S. Cl. 62—6 **12 Claims**

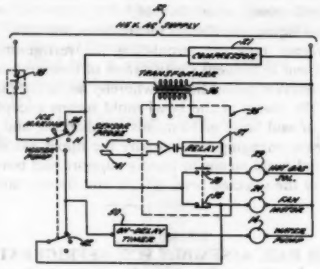


1. A cryogenic refrigerator comprising a rotary drive shaft, a reciprocating compressor piston assembly including a compressor piston driven along a first axis by the drive shaft through a drive eccentric, a reciprocating displacer driven along a second axis, angled about 90 degrees from the first axis, by the drive shaft through said drive eccentric and a displacer connecting rod, and an eccentric counterweight mounted to the drive shaft with a center of gravity about 180 degrees about the drive shaft from the drive eccentric center, the displacer connecting rod having a pivotal connection to each of the displacer and the drive eccentric such that it has a wobbling motion as it drives the displacer, wherein the weight of the compressor piston is substantially greater than the weight of the displacer, the displacer connecting rod comprises high density material such that the weight of the connecting rod is greater than the weight of the displacer, the combined weight of the displacer and connecting rod is about the same as the weight of the compressor piston assembly, and the weight of the counterweight is such that it substantially balances the rotating drive eccentric and the reciprocating compressor piston assembly, displacer connecting rod and displacer in the first harmonic.

4,550,572
ICE MACHINE ANTI-BLOCK CONTROL

Carl J. Schulze-Berge, Manitowoc, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Mich.

Filed Jul. 27, 1984, Ser. No. 635,157
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—138 **4 Claims**

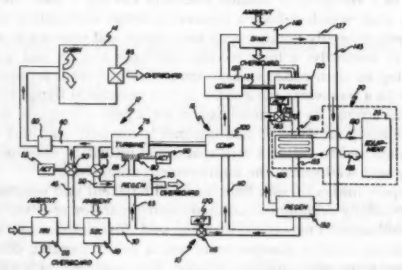


1. In an ice making machine having an evaporator and ice mold, a water circulation system including a pump for circulating water over the mold during an ice making cycle, a circuit for stopping the pump at the end of an ice making cycle to initiate an ice harvesting cycle, and a circuit for starting the pump at the end of an ice harvesting cycle to initiate the next ice making cycle, the improvement comprising, a delay device in said circuit for starting the pump so that the ice making cycles start with a period for cooling the evaporator and mold before water is circulated over the mold.

4,550,573
MULTIPLE LOAD, HIGH EFFICIENCY AIR CYCLE AIR CONDITIONING SYSTEM

George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,613
Int. Cl.[4] F25B *19/02*
U.S. Cl. 62—172 **7 Claims**

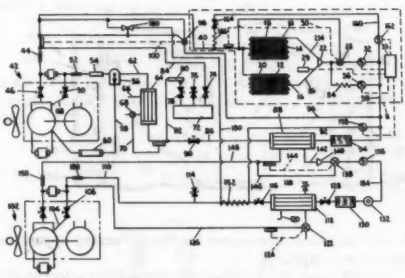


1. An air cycle air conditioning system characterized by:
a first load requiring the maintenance of the temperature and pressure thereof by fresh air continuously supplied thereto and subsequently discharged therefrom;
a first turbine having an inlet and an outlet and adapted for communication with, and driven by a source of pressurized air, said first turbine expanding and chilling said pressurized air and discharging said expanded and chilled air to said first load;
first means, providing fluid communication between the inlet of said first turbine and said pressurized air source;
a first compressor having an inlet and an outlet and connected to, and driven by said first turbine and being adapted for the pressurization of a quantity of air circulated therethrough;
a second turbine having an inlet and an outlet and being connected to said first compressor for providing a measure of input power thereto;
second means providing fluid communication between the outlet of said first compressor and the inlet of said second turbine, said second turbine being driven by an expanding and chilling said air supplied thereto from said first compressor;
a second load isolated from said expanded and chilled air discharged to said first load by said first turbine, said second load being capable of having the pressure and temperature thereof maintained by chilled air recirculated therethrough, said chilled air being ducted to said second load from said second turbine; and
third means providing fluid communication between the outlet of said second load with the inlet of said first compressor whereby substantially all the air supplied to said second load by said second turbine is returned from said second load to said first compressor and subsequently to said second turbine for continuous recirculation through said first compressor, said second turbine and said second load, thereby efficiently cooling and pressurizing said second load under power from said first turbine.

4,550,574
REFRIGERATION SYSTEM WITH LIQUID BYPASS LINE

John E. Hohman, Evart, Mich., assignor to Sexton-Espec, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 500,266, Jun. 2, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 663,033
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—197 **8 Claims**



1. A refrigeration system including a compressor and cooling system for supplying a refrigerant to an evaporator unit for cooling a chamber to a selected temperature, said evaporator unit being located adjacent said chamber and remote from said compressor and cooling system and including a heat-exchange surface;
supply conduit means for communicating said refrigerant from said compressor and cooling system to said evaporator unit, said supply conduit including first and second conduits connected in series, said second conduit being adjacent said chamber;
expansion valve means for providing a cooled and expanded refrigerant to said evaporator unit disposed in said second conduit and between said evaporator unit and said compressor and cooling system;
first control valve means in said second conduit for controlling the flow of refrigerant to said expansion valve means;
first control means for controlling said first control valve means responsive to the temperature in said chamber; and

a return line for communicating spent refrigerant from said evaporator unit to said compressor and cooling system;

the improvement which comprises:

first bypass conduit means for diverting cooled refrigerant from said supply conduit line around said evaporator unit and to said return line, said first bypass conduit connected at one end to said first conduit means at said evaporator unit and at the other end thereof connected to said return line at said evaporator unit, said bypass conduit means including second control valve means for selectively diverting said refrigerant to said return line;

a second bypass line connected at one end to said first conduit at said compressor and cooling system and at the other end thereof connected to said return line at said compressor and cooling system to return refrigerant to said compressor and cooling system;

a third control valve means in said second bypass line to control the flow of refrigerant through said second bypass line;

said first control means simultaneously controlling said first, second and third valve means to open said second and third control valve means while closing said first control valve means and vice versa, in responsive to temperature changes in said chamber;

whereby said first bypass conduit and said second bypass conduit operate in response to low-demand conditions at said evaporator unit so as to provide a constant liquid refrigerant flow through said refrigeration system.

4,550,575

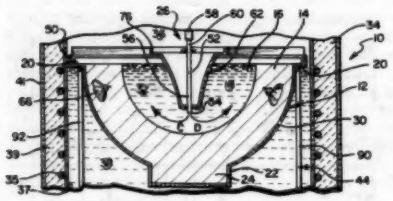
ICE BOWL FREEZING APPARATUS

G. Scott DeGaynor, 188 Wealthy, SW., Grand Rapids, Mich. 49503

Continuation of Ser. No. 518,648, Jul. 29, 1984, abandoned. This application Jan. 25, 1985, Ser. No. 694,831

Int. Cl.[4] F25C *1/18*

U.S. Cl. 62—308 **23 Claims**



1. A self-contained, decorative ice bowl freezing apparatus, said apparatus comprising:

a bowl mold means for forming an ice bowl of a selected size and shape, said bowl mold means for containing water to be frozen adjacent the walls thereof only and for forming the ice bowl thereby, and said bowl mold means having an upper extremity around the rim thereof;

air circulation means disposed within the opening of said bowl mold means from the top thereof for supplying a stream of air bubbles to the freezing water in said bowl mold means for slowing the freezing thereof to provide ice of greater clarity, and also for freezing of the water substantially adjacent to the walls of the bowl mold means, but simultaneously for maintaining the water in the center of the bowl mold means continuously in an unfrozen condition, such that when the remaining unfrozen water is removed from the central area of the bowl mold means, a frozen bowl shape results therefrom;

frame means mounted on substantially the upper extremity of the bowl mold means for positionally holding said air circulation means within the opening of said bowl mold means at the rim thereof;

a portable and free-standing freezer tank, said freezer tank having an opening at the top thereof and said bowl mold means disposed therewithin, said freezer tank being adaptable for containing a refrigerant liquid, the level of which in said freezer tank extends a substantial distance up the side of said bowl mold means to a level less than that of the upper extremity of said bowl mold means, whereby said bowl mold means is substantially immersed within the refrigerant liquid contained within, but the refrigerant liquid does not spill over the bowl mold means to contaminate the freezing water thereof;

refrigerant liquid circulation means disposed solely within said freezer tank for circulating the refrigerant liquid thereof and to prevent stratification of temperature levels within the refrigerant liquid, whereby uniformity of freezing of the water in the bowl mold means except in the center of said bowl mold means is enhanced; and

frame means engaging substantially the upper extremity of said bowl mold means to fixedly support said bowl mold means at the selected level within said freezer tank.

4,550,576

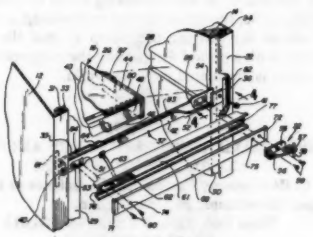
CENTER RAIL ASSEMBLY FOR REFRIGERATOR

Ralph Tate, Jr., Center Township, Vanderburgh County, and John T. Woods, Scott Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 19, 1984, Ser. No. 651,901

Int. Cl.[4] F25D *11/02*

U.S. Cl. 62—441 **33 Claims**



1. In a refrigerator cabinet assembly having a sheet metal outer shell which defines a transverse flange terminating in a channel generally parallel with said flange and opening transversely inwardly, a liner having sidewalls and an end wall defining an open-ended storage space, said sidewalls terminating with a transverse outwardly turned peripheral flange continuous around its perimeter except for a pair of notches, said flange being received in said channel to support said liner in said shell and to define a wall space, and insulation essentially filling said wall space, the improvement comprising:

support means on said liner sidewall adjacent said notches;

a generally rectangular compartment separator received in said support means and dividing said storage space into an above-freezing compartment and a below-freezing compartment, said separator spaced from said liner sidewalls defining a horizontal passage forwardly along the sidewalls of said liner;

a center rail bracket spanning opposite sides of said wall space along the front edge of said channel adjacent one of said liner flange notches, wherein said notch, one end of said bracket and said channel form a duct between said above-freezing compartment and said below-freezing compartment;

a center rail cover overlying said center rail bracket defining a generally horizontal chamber therewith, wherein at least a portion of said cover is metal, said passage, said chamber, and said duct being interconnected and in fluid communication with said above-freezing compartment and said below-freezing compartment; and

seal means to prevent air currents across or along any portion of said duct or said chamber.

4,550,577

KNITTING MACHINE WITH ROCKING KNOCK-OVER BITS, AND METHOD OF KNITTING THEREWITH

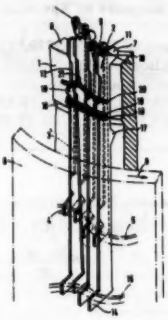
Falk Kühn, Kiebingen, and Alfred Buck, Hailfingen, both of Fed. Rep. of Germany, assignors to Memminger GmbH, Freudenstadt, Fed. Rep. of Germany

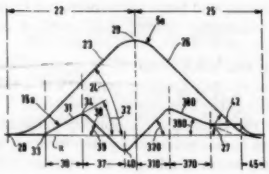
Filed Dec. 8, 1983, Ser. No. 559,494

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247767

Int. Cl.⁴ D04B *15/24, 15/06*

U.S. Cl. 66—104 **20 Claims**





1. Method of knitting yarn to form stitches or loops (36) on a knitting machine having

a needle bed (1);

a plurality of elongated latch needles (2), each having a pivotable latch (35), the needles being longitudinally slidable on the needle bed;

including the step of

moving the needles between a base or rest position (28; FIGS. 4, 12) and a clearing position (29; FIG. 8) through a tuck position (FIG. 7) in a raising or extending phase, and

from the clearing position (29; FIG. 8) through a yarn insertion position (FIG. 10) to the base or rest position (28; FIGS. 4, 12) in a lowering or retracting phase,

and comprising, in accordance with the invention, the step of

positively moving (FIG. 6) the last-formed stitch or loop (36) on the needle during the raising phase in the direction of movement of the needle with a speed which is slower than the raising speed of the needle at least until (FIG. 6) the stitch or loop (36) has engaged the latch (35) of the needle and is opening the latch;

and positively moving the last-formed stitch or loop (36) in a direction counter the raising or extending direction of the needle upon opening of the latch on the needle (FIG. 7, FIG. 8).

4,550,578

APPARATUS FOR LOW-TEMPERATURE PLASMA TREATMENT OF A TEXTILE PRODUCT

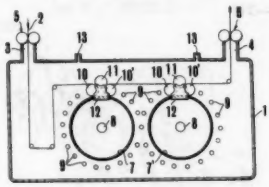
Yoshikazu Sando, Wakayama; Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Hiroshi Ishidoshiro, and Matsuo Minakata, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Tokyo, Japan

Division of Ser. No. 452,101, Dec. 22, 1982, Pat. No. 4,466,258. This application Feb. 23, 1984, Ser. No. 583,002

Claims priority, application Japan, Jan. 6, 1982, 57-817; Jan. 6, 1982, 57-819

Int. Cl.⁴ D06B *3/12*

U.S. Cl. 68—5 E **1 Claim**



1. An apparatus for uniformly applying a low-temperature plasma to a textile product comprising a reaction chamber, seal mechanisms for maintaining the interior of the chamber under a reduced pressure while allowing for the transportation of a cloth to be treated therethrough, one or more guide drums having a permeable surface provided in the reaction chamber for transporting the cloth therearound, and a gas supply inlet for supplying a gas to the reaction chamber, a plurality of electrodes spacedly provided around the outer circumference of said guide drums for producing a low temperature plasma atmosphere which can permeate the fabric on the drums and at the rotation center of the drums a vacuum pipe connecting to a vacuum pump.

4,550,579

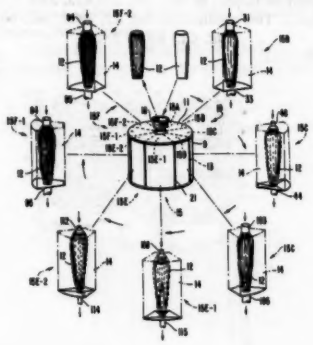
APPARATUS FOR THE DYEING OF SHAPED ARTICLES

G. Frank Clifford, P.O. Box 163, Old Hwy. 27, Stanley, N.C. 28164

Filed Apr. 13, 1984, Ser. No. 600,284

Int. Cl.⁴ D06B *1/04, 23/04*

U.S. Cl. 68—5 C **28 Claims**



1. An apparatus for the dyeing of shaped articles comprising:

(a) a treatment chamber;

(b) means for surrounding a shaped article with a non-reactive environment in said treatment chamber; and

(c) means for flowing a thin continuous film of a dye compo-

sition over the surfaces of said shaped article at an elevated temperature in the non-reactive environment.

4,550,580

ROTATABLE CONNECTION DEVICE

Guy Neyret, Ouilins, France, assignor to Neiman S.A., Courbevoie, France

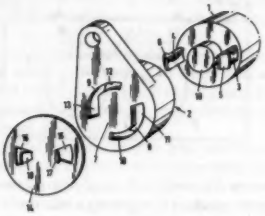
PCT No. PCT/EP83/00123, § 371 Date Jan. 11, 1984, § 102(e) Date Jan. 11, 1984, PCT Pub. No. WO83/04067, PCT Pub. Date Nov. 24, 1983

PCT Filed May 16, 1983, Ser. No. 579,891

Claims priority, application France, May 19, 1982, 82 08755

Int. Cl.⁴ E05B *9/08*

U.S. Cl. 70—370 **2 Claims**



1. Rotatable connection device for a driving part to a driven part, wherein the driven part has a rotational play relative to the driving part, characterised in that the driving part (1) exhibits at least two axial elastic dogs (3,4) which each end in a radial tooth (5,6) and each cooperate with a circular arcuate slot (8,9) in the driven part (2), which exhibits an enlarged region (11, 13) for the passage of the radial tooth (5,6) of the corresponding dog (3,4), and with a securing part (14) which is provided with holes (15, 16) to receive the ends of the elastic dogs (3,4), and the holes (15, 16) of which each exhibit a bendable strap (17, 18) which, after being bent behind the relevant dog (3,4), come into abutment opposite the tooth (5,6) at the end of said dog.

4,550,581

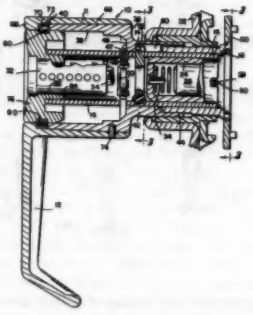
BREAK-AWAY KNOB DRIVER

Walter E. Best, and William R. Foshée, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Continuation-in-part of Ser. No. 503,769, Jun. 13, 1983, which is a continuation-in-part of Ser. No. 270,825, Jun. 5, 1981, Pat. No. 4,394,821. This application Jul. 22, 1983, Ser. No. 516,549

Int. Cl.⁴ E05B *3/04*

U.S. Cl. 70—422 **20 Claims**



1. In a door lock mechanism having a cylindrical knob sleeve or the like on which a knob or handle is rotatably mounted, a retainer for retaining the knob or handle on the knob sleeve, the knob sleeve having an inner face, means for connecting the knob against rotation on the knob sleeve comprising

a separate driver mounted transversely in the knob sleeve in a spaced-relation to the retainer, and

a drive lug on the driver, the drive lug projecting radially from the knob sleeve into positive engagement with an inward-opening recess in the knob, the drive lug being formed with a weak section adapted to shear under a predetermined torque to release the torque-transmitting connection between the knob and knob sleeve.

4,550,582

METHOD OF PRODUCING STEEL H-SHEET PILE

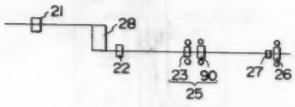
Takashi Ehiro; Teruaki Tanaka, and Eisuke Yamanaka, all of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Continuation-in-part of Ser. No. 229,111, Jan. 28, 1981, abandoned. This application Oct. 27, 1982, Ser. No. 436,993

Claims priority, application Japan, Feb. 4, 1980, 55-12222; Feb. 4, 1980, 55-12223; Feb. 19, 1980, 55-19589

Int. Cl.⁴ B21B *1/10, 13/08*

U.S. Cl. 72—234 **4 Claims**



1. A method of producing a steel H-sheet pile from a beam blank of an H-shape cross section defined by a web and a pair of flanges on both ends of the web symmetrical in vertical and lateral directions, said beam blank prepared through blooming rolling or continuous casting, said method comprising the ordered steps of:

(a) rolling the beam blank in a breakdown mill having a preparatory step forming caliber and a forming caliber, said rolling step comprising the steps of:

shifting the positional relationship between the web and flanges in said preparatory step forming caliber so as to roll the beam blank into an asymmetrical shape in its vertical direction by moving the web in one vertical direction while restraining the flanges in their positions; and subsequently

forming roughly a finger joint portion having a longer projection piece and shorter projection piece at one end of one of said flanges in said forming caliber;

(b) further rolling the beam blank roughly formed in said breakdown mill in a group of roughing universal mills including a roughing universal mill and a sizing universal mill, said further rolling step comprising the steps of:

reducing the thickness of the web and flanges of the beam blank by said roughing universal mill; and

sizing the end portions of the flanges while supporting the flanges so as to prevent the flanges from falling down, said sizing step being performed by horizontal rolls of said sizing universal mill and said supporting step being performed by vertical rolls of said sizing universal mill;

(c) forming said finger joint portion at the end of one of said flanges by a joint forming device having first and second rollers without using any intermediate mills, said forming step being performed by bending said longer projection piece by a first forming ridge on said second roller while limiting the bending position of said longer projection piece by pressing said longer projection piece against a second forming ridge on said first roller; and

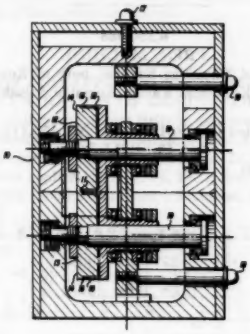
(d) completing the forming of the beam blank to provide the steel H-sheet pile by rolling said blank in a finishing universal mill.

4,550,583

QUICK ADJUSTING ROLLING MILL

Eugene T. Sanders, LaGrange, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed May 10, 1982, Ser. No. 376,359
Int. Cl.[4] B21B *31/18*
U.S. Cl. 72—247 13 Claims



1. A square wire and rectangular wire rolling mill of the type wherein wire is deformed by the grooves of cooperating work rolls comprising:

at least two segmented work rolls each having first and second concentrically aligned segments; and

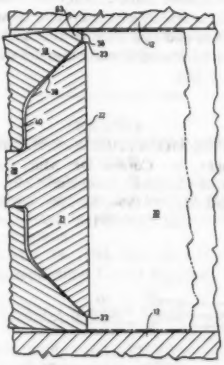
means coupled to one of said segments on each roll for simultaneously adjusting the position of said one segment relative to the other segment of each of said work rolls in equal increments.

4,550,584

FIXED DUMMY BLOCKS

Max F. Degen, Weston, Canada, assignor to Indalex, Division of Indal Limited, Canada

Continuation-in-part of Ser. No. 107,932, Dec. 28, 1979. This application Aug. 29, 1983, Ser. No. 527,404
Int. Cl.[4] B21C *26/00*
U.S. Cl. 72—273 26 Claims



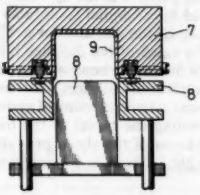
1. In an expandable fixed dummy block for fixing on the end of a stem of an extrusion press, the dummy block having a longitudinally extending axis of symmetry and outer wall, comprisng a base having a central cavity symmetrical about the axis symmetry, and a mandrel symmetrical about the longitudinal axis for sitting in the cavity in the base and mounted to rotate freely therein, the cavity defined by an endless side wall sloping radially inwardly away from its mouth from the outer wall to a bottom and the mandrel having a face and side wall sloping radially inwardly from the edge of the mandrel to a rear seat and having an outer edge bevelled so as not to extend radially beyond the inner radial dimensions of the mouth of the cavity, the angle of the side wall defining the cavity to the axis of symmetry being less than the angle of the side wall of the mandrel to the axis of symmetry.

4,550,585

DEVICE FOR HOLDING A WORKPIECE IN A PRESS

Naoyoshi Sasaki, 1067-2, Kami-Echi, Atsugi 243, Japan

Filed Oct. 12, 1984, Ser. No. 660,017
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—351 10 Claims



1. In a sheet metal working press including an upper press member and a lower press member which are movable relative to each other to work a sheet of metal therebetween, the improvement which comprises:

one of said press members having a groove formed in the vicinity of an effective working area defined by the movement of said press members relative to each other;

at least one holding block fitted loosely in said groove and having at least one holding surface, said block having a plurality of first holes formed in a surface remote from said holding surface; and

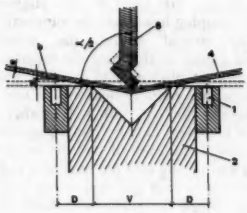
an elastic member of polyurethane fitted tightly in each of said holes.

4,550,586

DEVICE FOR FORMING PART OF A PRESS BRAKE FOR DETERMINING AUTOMATICALLY THE THICKNESS OF THE SHEET

Jean-Daniel Aubert, Le Mont s/Lausanne, and André Fornerod, Giez s/Yverdon, both of Switzerland, assignors to Cybelec S.A., Renens, Switzerland

Filed Nov. 1, 1983, Ser. No. 547,641
Claims priority, application Switzerland, Nov. 5, 1982, 6440/82
Int. Cl.[4] B21D *9/05*
U.S. Cl. 72—389 7 Claims



1. A process for bending a sheet by means of a press brake, comprising the step of simultaneously determining the thickness of the sheet by measuring the difference between the

position of the tip of the forming tool and that of the upper surface of the die, at the moment that the lower surface of the sheet rises from the upper surface of the die, and correcting the travel of the tool according to the determined thickness of the sheet, thus obtaining the required bend angle without any interruption of the forming cycle.

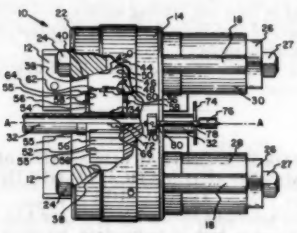
6. A device forming part of a press brake for determining automatically the thickness of a sheet being formed and for simultaneously correcting the travel of a forming tool operatively connected to a press brake beam, comprising at least one detector located at the level of the upper surface of a die, said die facing said forming tool and cooperating therewith provided to detect the moment that the lower surface of the sheet rises from the upper surface of the die, at least one lineal digital transducer at the end of the press brake beam, a numerical control system operatively connected to the detector and the lineal digital transducer for continuously measuring the difference between the position of the tip of the forming tool located by means of said lineal digital transducer and the position of the upper surface of the die, and for adding the value of this difference to the value of the distance travelled by the tip of the forming tool due to the bend in the sheet until the moment that the lower surface of the sheet rises from the upper surface of the die, and said numerical control system further including means for correcting the travel of the tool according to the determined thickness of the sheet, provided to obtain the required bend angle without any interruption of the forming cycle.

4,550,587

HEAVY DUTY HOSE CRIMPER

George W. Eisenzimmer, Lakemore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 15, 1983, Ser. No. 561,833
Int. Cl.[4] B21D *41/04*
U.S. Cl. 72—402 **11 Claims**



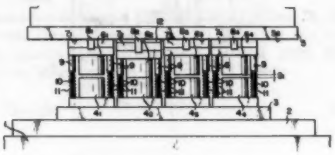
1. A crimping apparatus for radially compressing a tubular fitting against the exterior of a cylindrical hose comprising a first head, a crimping head mounted for relative axial movement toward and away from said first head, said crimping head having a circular opening located around an axis of the apparatus for receiving said hose and tubular fitting, a die supporting ring mounted on said first head in axial alignment with said opening in said crimping head, said die supporting ring having circumferentially spaced guides, die members slidably mounted in said guides so that said die members are radially positioned thereby establishing said opening, pusher members positioned at locations radially outward of said die members and in unconnected contact with said pusher members for pushing said die members radially inward against said tubular fitting, means connecting each of said die members to the die supporting ring and urging said die members radially outward to an open position in said die supporting ring, said pusher members having sloped flat surfaces inclined to said axis engageable with sloped flat surfaces on said crimping head inclinded to said axis and power means for moving said crimping head and said first head together whereby sliding movement of said sloped flat surfaces of said pusher members along said sloped flat surfaces of said crimping head causes said pusher members to move radially inward forcing said die members radially inward into crimping engagement with said tubular fitting and pusher means connecting said first head and each of said pusher members to urge said pusher members radially outward against said sloped flat surfaces on said crimping head and permit said pusher members to slide radially along a radial surface of said first head.

4,550,588

PRESS MACHINE

Toshio Abe, and Terushige Sakurai, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,172
Int. Cl.[4] B21J *7/46*
U.S. Cl. 72—441 **3 Claims**



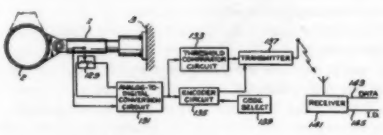
1. A press machine, comprising:
a bed;
a bolster mounted on said bed;
a plurality of lower dies each mounted on said bolster;
a slide movable towards and away from said bed;
a plurality of upper dies movably mounted to said slide each facing said respective lower dies;
a plurality of die clamper means each for mounting said respective upper dies to said slide;
a plurality of adapter means each disposed between said respective upper dies and said slide in such a manner that a predetermined gap exists between each pair of said upper and lower dies when said slide is moved down to a bottom dead center of the press with each of said adapter means making contact with said slide;
a plurality of biasing means each for biasing said respective upper dies towards said adapter means so that said respective adapter means make contact with said slide; and
activating means selectively insertable between any of said adapter means and said slide so that said activated upper die or dies are allowed to make contact with said opposing lower die or dies.

4,550,589

SYSTEM FOR MONITORING SNUBBER LOADS

William S. Wright, Jr., Corona Del Mar, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed May 2, 1984, Ser. No. 606,287
Int. Cl.[4] G01M *7/00*
U.S. Cl. 73—11 **18 Claims**



1. An apparatus for monitoring pipe motion snubbers in a piping system, comprising:
sensing circuits which measure the effects of pipe movement on the pipe motion snubbers;
data transmitters, electrically connected to the sensing circuits, which transmit signals responsive to the measured

effects, which signals identify the pipe motion snubbers on which the effects are measured;

data receivers which receive the transmitted signals from a plurality of data transmitters and which generate output signals which identify the pipe motion snubbers on which the effects were measured; and

a device, electrically connected to the output of the data receivers, which indicates the pipe motion snubbers on which the effects were measured.

4,550,590

METHOD OF AND APPARATUS FOR MONITORING CONCENTRATION OF GAS IN A LIQUID

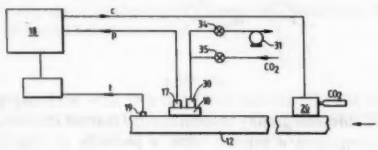
James Kesson, Edinburgh, Great Britain, assignor to Scottish & Newcastle Breweries plc, Edinburgh, United Kingdom

Continuation-in-part of Ser. No. 275,964, Jun. 22, 1981, Pat. No. 4,461,165. This application Aug. 18, 1983, Ser. No. 524,190

Claims priority, application United Kingdom, Aug. 24, 1982, 8224218

Int. Cl.⁴ G01N *7/10*

U.S. Cl. 73—19 **11 Claims**



1. A method of monitoring the concentration of gas in a liquid comprising the steps of:

passing said liquid across a semi-permeable membrane in order that gases in the liquid may permeate through the membrane into a chamber;

measuring the pressure in said chamber after a predetermined first period to obtain a first pressure reading, said first period being such as to allow permeation of a first gas and a second gas through said membrane until equilibrium conditions with respect to both gases is reached;

evacuating said chamber;

measuring the pressure in said chamber after a second, relatively shorter period to obtain a second pressure reading, said second period being sufficient to allow equilibrium conditions with respect only to said first gas to be reached; and

deriving from said first and second pressure readings a reading indicative of the concentration of said second gas in said liquid.

4,550,591

APPARATUS FOR MONITORING PARTICULATE MATTER

Anthony F. Cox, Nr Baddesley; Roger Glanville, Chandlers Ford; Owen Lloyd, Lyndhurst, and Keith V. Robbins, Liss, all of England, assignors to Central Electricity Generating Board, London, England

Filed Mar. 19, 1984, Ser. No. 591,152

Claims priority, application United Kingdom, Mar. 25, 1983, 8308246

Int. Cl.⁴ G01N *15/00*

U.S. Cl. 73—28 **7 Claims**

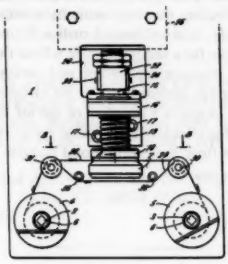
1. Apparatus for monitoring particulate matter in a fluid, including filter means comprising

an elongate strip filter medium in the form of a separable laminate formed of a filter material and backing strip;

a filter medium transport arrangement comprising two rotatable spools having the filter medium extending between them with means to separate the backing strip from the filter material over a short distance between the spools;

means for passing the fluid through the filter material where separated from the backing strip at a substantially constant flow rate, the transport arrangement being operable to move the filter medium between the spools thereby to present a new portion of filter material for passage of fluid therethrough;

pressure sensing means arranged to sense the fluid pressure difference across the filter material where the fluid is



passing therethrough and to produce a pressure signal indicative of the pressure difference sensed; and

processing means arranged to receive the pressure signal and to evaluate therefrom the rate of change of the pressure difference thereby to give an indication of the particulate matter level in the fluid.

4,550,592

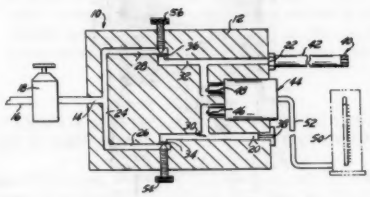
PNEUMATIC GAUGING CIRCUIT

Michel L. Dechape, 19963 Schoolhouse Ct., Northville, Mich. 48167

Filed May 7, 1984, Ser. No. 607,783

Int. Cl.⁴ G01B *13/10*

U.S. Cl. 73—37.5 **2 Claims**



1. A pneumatic circuit for pneumatic gauging, said pneumatic circuit comprising an inlet to which compressed air is supplied, a first branch passageway connected to said inlet, said first branch passageway having a first outlet, a second branch passageway connected to said inlet, said second branch passageway having a second outlet, a first needle valve adjustable control orifice in said first branch passageway between said inlet and said first outlet defining a first pressure chamber between said first control orifice and said first outlet, a second needle valve adjustable control orifice between said inlet and said second outlet defining a second pressure chamber between said second control orifice and said second outlet, a differential pressure transducer having a first port connected to said first chamber and a second port connected to said second chamber, said differential pressure transducer being adapted to provide an electrical output signal to a measurement display instrument as a function of the pressure differential between said chambers, said first and second adjustable orifices being adjustable for effecting respectively sensitivity and datum scale settings of the measurement display instrument, a first flow orifice connected to said first outlet, and a second flow orifice connected to said second outlet, wherein at least said first flow orifice

connected to said first outlet is a variable flow first nozzle whose flow rate is dependent upon the distance separating said first nozzle from a surface causing the pressure of the air circulating in said first chamber to vary as a function of the air flow through said first nozzle and said second flow orifice connected to said second outlet is a calibrated orifice fitting having a fixed area and venting said second pressure chamber to the ambient for effecting measurements by means of said variable flow first nozzle, said calibrated orifice fitting being replaceable by a variable flow second nozzle whose flow rate is dependent upon the distance separating said second nozzle from a surface causing the pressure of the air circulating in said second chamber to vary as a function of the air flow through said second nozzle for effecting differential measurements by means of said variable flow first and second nozzles.

4,550,593

TURBOMOLECULAR PUMP SUITABLE FOR PERFORMING COUNTERFLOW LEAKAGE TESTS

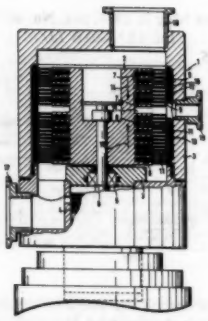
Günter Reich, Cologne, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,403

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3133781

Int. Cl.⁴ G01M *3/20*

U.S. Cl. 73—40.7 **6 Claims**



1. A turbomolecular pump for a counterflow gas-leakage testing arrangement having one of a container to be tested or a test tank with a container therein to be tested for a leakage-testing test gas, a test gas detector for detecting the test gas, and a forepump for assisting the turbomolecular pump, the turbomolecular pump comprising:

two, tandemly-arranged, turbomolecular pump stages (**12,13**) for pumping toward each other into a common, open space (**21**) directly therebetween;

a common pump casing (**3**) about the pump stages and the common, open space (**4**) directly therebetween;

means (**6**) for rotating the pump stages;

first and second connections (**17,18**) through the common pump casing at opposite ends of the pump stages for respective connection to the one of the container or test tank and to the test gas detector; and

a connection (**19**) through the common pump casing to the common, open space between the pump stages for connection to the forepump.

4,550,594

SEPARABLE COLUMN FOR CHROMATOGRAPHY WITH A DETECTION AND SIGNAL DEVICE AND AN ELUTION SYSTEM - IN COMBINATION OR SEPARATE

Nils M. L. Engström, Gothenburg, Sweden, assignor to Lars G. I. Hellgren, Vastra Frolunda and Jan G. Vincent, Stockholm, both of, Sweden

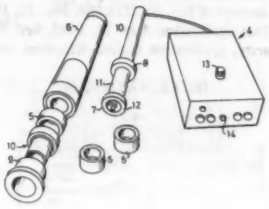
PCT No. PCT/SE83/00309, § 371 Date May 2, 1984, § 102(e) Date May 2, 1984, PCT Pub. No. WO84/00900, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 2, 1983, Ser. No. 610,296

Claims priority, application Sweden, Sep. 3, 1982, 8205033

Int. Cl.⁴ G01N *31/08*

U.S. Cl. 73—61.1 C **9 Claims**



1. A chromatography column for dry column chromatography comprising a support tube, a plurality of ring-shaped members capable of being removably inserted into and supported by said support tube, said ring-shaped members further capable of being packed with a chromatographic gel whereby after elution the ring can be removed from the support tube to recover an eluted material.

4,550,595

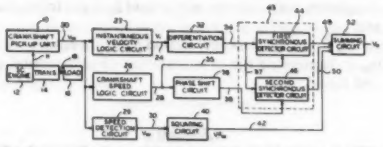
TORQUE MEASUREMENT CIRCUIT AND METHOD

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 11, 1984, Ser. No. 609,601

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—116 **20 Claims**



1. A torque measurement circuit for an internal combustion engine of the four cylinder, two-cycle type which accounts for inertia forces due to the mass of the pistons and connecting rods, said circuit comprising:

pick-up means having an input indicative of the angular displacement of the crankshaft in an internal combustion engine from top dead-center position for generating a first signal directly proportional to the rotational speed of the crankshaft, said first signal having a portion indicative of when the piston is at top dead-center position;

first circuit means responsive to said first signal proportional to the rotational speed for generating a second signal directly proportional to the engine's instantaneous rotational velocity;

second circuit means responsive to said portion of said first signal indicative of when the piston is at top dead-center position for generating a sine wave signal at twice the angular displacement of the crankshaft;

third circuit means also responsive to said portion of said

first signal for generating a third signal directly proportional to the engine's average angular velocity;

fourth circuit means for differentiating said second signal to generate a fourth signal directly proportional to angular acceleration;

fifth circuit means responsive to said sine wave signal for phase shifting said sine wave signal by 90 degrees for generating a cosine wave signal;

sixth circuit means responsive to said fourth signal proportional to acceleration, sine wave signal, and cosine wave signal for generating fifth and sixth signal both representative of average torque due to pressures inside of the cylinders and of impulse torque due to the mass of the pistons and connecting rods;

seventh circuit means responsive to said third signal for generating a seventh signal directly proportional to the square of the engine's average angular velocity; and

eighth circuit means for combining said fifth and sixth signals from said sixth circuit means with said seventh signal from said seventh circuit means to produce a resultant output signal proportional to the average torque and independent of the engine's speed with the effects of inertia forces being cancelled.

4,550,596

APPARATUS FOR INDICATING AN OPTIMUM SHIFT POSITION FOR A MANUAL TRANSMISSION INSTALLED IN A VEHICLE

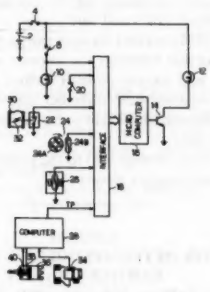
Masahiro Ueda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 2, 1984, Ser. No. 596,104

Claims priority, application Japan, Apr. 6, 1983, 58-60157; Apr. 6, 1983, 58-60158

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—117.3 **56 Claims**



1. An apparatus for indicating an optimum gearshift position for a manual transmission installed in a vehicle, comprising:

an engine speed sensor for detecting a speed of an engine;

an engine load sensor for detecting a load on an engine;

memory means for storing parameters of engine speed and parameters representing engine load for creating an upshift zone;

comparison means for determining whether the detected speed of the engine and the detected load on the engine fall within the stored parameters of engine speed and engine load which create the upshift zone;

timing means for measuring a predetermined amount of elapsed time when the detected speed of the engine and the detected load on the engine fall within the stored parameters of engine sped and engine load which create the upshift zone;

indication means for instructing that upshifting is necessary when the detected speed of the engine and the detected load on the engine fall within the stored parameters of engine speed and engine load which create the upshift zone; and

delay means for delaying the instructing by the indication means that upshifting is necessary until the detected speed of the engine and the detected load on the engine have been within the stored parameters of engine speed and engine load, which create the upshift zone, for a predetermined amount of time.

4,550,597

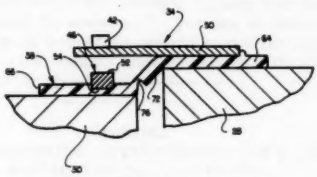
METHOD AND APPARATUS FOR SENSING RELATIVE MOVEMENT BETWEEN MEMBERS

Gilbert H. Drutchas, Birmingham, and John S. Borza, Sterling Heights, both of Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 4, 1984, Ser. No. 596,655

Int. Cl.⁴ G01R *33/06*

U.S. Cl. 73—118 **19 Claims**



1. Apparatus for sensing relative rotational movement between two members, said apparatus comprising:

a first part for movement with one member,

a second part for movement with the other member, said first and second parts having means for creating an electrical signal upon relative movement thereof,

a base having first and second portions, said first and second portions of said base being fixedly mountable on said respective members, said base having a third portion which is separable after said first and second portions are fixedly mounted on said first and second members to effect separation of said first and second portions.

4,550,598

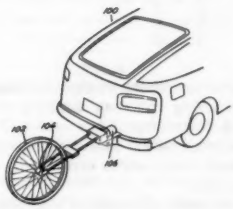
APPARATUS AND METHOD ADAPTED TO TEST TIRES BY ELIMINATING JITTER FROM DATA SIGNALS WITHOUT LOSING DATA

Frans N. Breedyk, Hunsdorf, Luxembourg, and Guido van Gelderen, Amstelveen, Netherlands, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 31, 1983, Ser. No. 547,330

Int. Cl.⁴ G01M *17/02*

U.S. Cl. 73—146 **24 Claims**



1. A method of testing tires comprising:

mounting the tires on a vehicle;

connecting to the vehicle a data signal generator for generating data signals having a period representing the distance traveled by the vehicle;

generating output signals substantially free of jitter;

generating a number signal in response to said data signals and said output signals, said number signal representing a digital number that remains substantially constant if the frequency of the data signals equals the frequency of the output signals, varies generally in a first direction if the frequency of the data signals is greater than the frequency of the output signals and varies generally in a second direction opposite the first direction if the frequency of the data signals is less than the frequency of the output signals; and

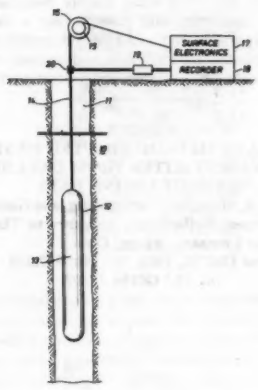
conditioning the number signal so that the frequency of the output signals tracks the frequency of the data signals over a substantial range of frequencies, whereby the number of output signals produced when the frequency of the data signals decreases from a first predetermined frequency to a second predetermined frequency can be counted by a digital computer so that the braking performance of the tires can be measured.

4,550,599

APPARATUS FOR RESTRAINING ELECTRONIC ASSEMBLIES

Michael L. Bridge, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 21, 1983, Ser. No. 459,865
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 **17 Claims**



1. A system for restraining an elongated instrument chassis adapted for mounting electronic circuitry thereon within a tubular housing, comprising:

a biased cam assembly for providing substantially rigid restraint of said chassis within said housing said cam assembly comprising;

a cam cooperatively arranged on said instruemnt chassis; and

bias means for biasing said cam into cooperative engagement with said housing; and

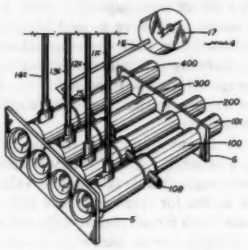
means for latching said cam assembly in a retracted position on said chassis for allowing insertion of said chassis within said housing.

4,550,600

LIQUID LEVEL GAUGE

Peter B. Lindgren, 4491 Crystal Lake Dr., Pompano Beach, Fla. 33064

Filed Aug. 8, 1983, Ser. No. 521,333
Int. Cl.[4] G01F *23/14*
U.S. Cl. 73—299 **6 Claims**



1. A device for determining the level of liquid (**11***b*) in a tank (**11**) comprising:

(a) A piston chamber (**107**) having one closed end and one open end;

(b) A piston (**101**) movable within said chamber and extending through said open end so as to be externally manipulable;

(c) Spring means (**102**) between the inner end of said piston and said closed end of said chamber;

(d) First conduit means (**11***c*, **11***cc*) for providing a flow path for said liquid and for connecting the liquid in the tank (**11**) to the interior of said chamber (**107**) through a wall thereof;

(e) An air-operated gauge (**17**);

(f) Second conduit means (**15**) for connecting the interior of said chamber (**107**) and said gauge (**17**);

(g) Means (**103**) carried by said piston for normally sealing off connection between the interior of said chamber and said first and second conduit means, but permitting connection between said chamber and said conduit means upon manipulation of said piston so as to press said piston inwardly; and

(h) Check valve means (**108**) to the atmosphere in one end of said second conduit means (**15**).

4,550,601

METHOD FOR DETERMINING THE MAGNITUDE OF EARTH'S GRAVITY

Alan G. Evans, LaPlata, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1984, Ser. No. 583,562
Int. Cl.[4] G01V *7/16*
U.S. Cl. 73—382 R **15 Claims**

1. A method for directly and continuously determining the magnitude of the gravity at one or more selected points in

relation to the earth's surface, the method comprising the steps of:

continuously transmitting encoded RF signals from a plurality of Global Positioning System (GPS) earth-orbiting satellites, such that the traasmitted RF signals of each GPS earth-orbiting satellite are a pair of encoded RF signals at predetermined frequencies that are directed in a radial direction towards the earth's surface, all GPS satellites of the plurality of satellites progressively and continuously advancing about the earth in relation to the field of view of the antenna of a user platform of the GPS system;

continuously and selectively processing the encoded RF signals received by the platform at one or more selected points from a series of GPS satellites of the plurality in the field of view of the antenna so as to initially determine the Doppler pseudo range between each satellite of the series and the platform and the radial relative velocity therebetween,

further processing the encoded RF signals of the series of satellites so as to select and track an optimum group of satellites of the series that will provide minimal error in determining the navigation position of the platform and the relative radial velocity of the platform with respect to each satellite of the optimum group,

also further processing the encoded RF signals of the optimum group of selected and tracked satellites so as to determine the relative radial acceleration of the platform with respect to each satellite thereof and to resolve the radial acceleration of the platform with respect to each satellite into the GPS vertical acceleration thereof,

measuring the vertical acceleration of said platform at one or more selected points by way of a gravimeter accelerometer arrangement mounted on the platform, and

also still further processing the encoded RF signals of the optimum group so as to compare the vertical acceleration of the platform with the GPS vertical acceleration of the platform, the comparison providing a difference that indicates the magnitude of the gravity in relation to the platform.

4,550,602

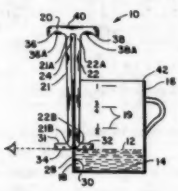
LIQUID LEVEL MARKER FOR CONTAINER

William L. Burke, Sr., 1701 W. Brandon Blvd., Brandon, Fla. 33511; Elwood Marple, 317 - 34th Ave. N., #109, St. Petersburg, Fla. 33704, and A. Eileen Suisman, 1004 Warwick Ct., Sun City Center, Fla. 33570

Filed May 11, 1984, Ser. No. 609,323

Int. Cl.[4] G01F *19/00*

U.S. Cl. 73—428 **7 Claims**



1. A device for visually sighting the level of a liquid material or a solid particulate material within a container having a container sidewall with markings on an external surface of the container sidewall, comprising in combination:

a handle;

a first leg having a first top end portion and a first bottom end portion;

a second leg having a second top end portion and a second bottom end portion;

said first and second top end portions being integrally connected to said handle and spaced apart a distance to accommodate the thickness of the container sidewall;

said first and second legs extending from said handle in a converging relationship establishing the first and second bottom end portions to be spaced apart a distance closer than said first and second top end portions;

a first and a second foot integrally connected to said first and second bottom end portions with said first and second feet extending substantially perpendicular to said first and second legs respectively;

said first and second legs being resilient, enabling the first and second bottom end portions to be separated upon positioning the first and second legs on the external and internal surfaces of the container sidewall and for enabling said first and second bottom end portions to resiliently engage the external and internal surfaces of the container sidewall to maintain the position of said first and second bottom end portions relative to said container sidewall; and

said first and second feet providing sighting lines external and internal the container for enabling an operator to determine the level of the material internal the container relative to the container sidewall marking or the external surface of the container sidewall.

4,550,603

ABNORMAL NOISE DETECTOR FOR USE IN THE INSPECTION OF GEAR UNITS

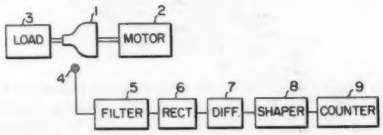
Koichi Fukada, Kobe, and Hiroshi Sugimoto, Toyonaka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 27, 1984, Ser. No. 593,836

Claims priority, application Japan, Mar. 29, 1983, 58-55602

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—587 **3 Claims**



1. An abnormal noise detector for the inspection of gear units having gears, two of which mesh and produce noise of a normal fundamental frequency which is a function of the rate at which the teeth of said two gears mesh, comprising:

a microphone placed in the vicinity of a gear unit to be tested; and

detecting means responsive to an electrical output signal from said microphone for continuously detecting momentary variations in the amplitude of the component of said signal having a prescribed frequency which is an integral multiple of said normal fundamental frequency.

4,550,604

ABNORMAL NOISE DETECTOR FOR INSPECTING GEAR UNITS

Hiroshi Sugimoto, Toyonaka, and Koichi Fukada, Kobe, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 22, 1984, Ser. No. 592,367

Claims priority, application Japan, Mar. 24, 1983, 58-50869

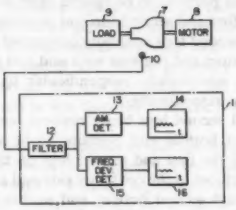
Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—587 **3 Claims**

1. An abnormal noise detector for inspecting gear units having gears, two of which mesh and produce noise of a normal fundamental frequency which is a function of the rate at which the teeth of said two gears mesh, comprising:

a microphone placed in the vicinity of a gear unit to be tested; and

detecting means responsive to an electrical output signal from said microphone for detecting the amplitude and



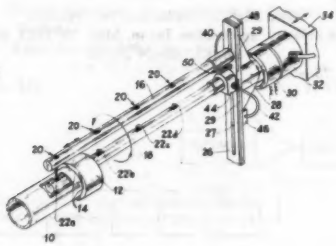
frequency deviations of said signal from the center frequency within a band of frequencies, the center frequency being an integral multiple of said normal fundamental frequency.

4,550,605

HOPPING MECHANISM FOR PIPE AND COUPLING INSPECTION PROBE

Elizabeth M. Bains, Pearland, Tex., assignor to AMF Inc., White Plains, N.Y.

Filed Aug. 15, 1984, Ser. No. 641,090
Int. Cl.[4] G01N *29/04, 27/82*
U.S. Cl. 73—622 **11 Claims**



1. In the nondestructive inspection of a tubular member having a cylindrical coupling of a different diameter secured to one end of the tubular member, wherein an inspection probe moves along the surface of the tubular member and encounters the end of the coupling as an obstacle to its further movement in a direction parallel to the tubular member axis, an improved mechanism for causing the probe to hop over the obstructing end of the coupling and onto the surface thereof, comprising the combination

a probe member adapted to include nondestructive tubular member inspection means,

a probe housing adaptive to receive said probe member,

the probe member being translatable relative to the housing onto and away from the surface of a tubular member placed adjacent said housing,

support means for supporting said housing for movement between first and second positions,

means for translating said support means with said housing and probe member parallel to the axis of a tubular member to be inspected, the obstructing end of the coupling forcing the housing to its second position when the moving probe member encounters said obstructing end, and

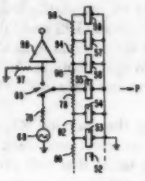
means operable only when the housing moves to its second position for withdrawing the probe from the surface of the tubular member and radially clear of the obstructing end of the coupling and for extending the probe member to the surface of the coupling when the housing returns to its first position once the obstructing end of the housing is cleared.

4,550,606

ULTRASONIC TRANSDUCER ARRAY WITH CONTROLLED EXCITATION PATTERN

Cornelis J. Drost, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,798
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—626 **33 Claims**



1. An ultrasonic transducer array exhibiting a transducer directivity pattern which is substantially symmetrical along at least one coordinate of the transducer surface, comprising:

a source of excitation;

a plurality of transducer elements;

first and second excitation electrode means connected first and second opposed surfaces, respectively, of each said transducer element;

impedance means interconnecting adjacent transducer elements; and

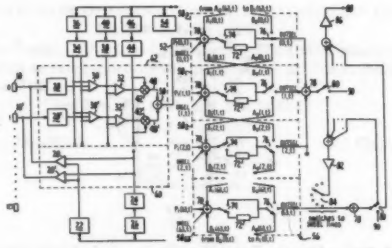
means to sequentially connect said source of excitation to selected transducer elements and simultaneously through said impedance means to adjacent transducer elements to excite said selected and adjacent transducer elements to produce said directivity pattern and to scan said pattern sequentially across the transducer array by said sequential connections.

4,550,607

PHASED ARRAY ACOUSTIC IMAGING SYSTEM

Samuel H. Maslak, and John N. Wright, both of Palo Alto, Calif., assignors to Acuson, Mountain View, Calif.

Filed May 7, 1984, Ser. No. 607,670
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—626 **19 Claims**



1. In an acoustic imaging system having means for repeatedly transmitting an acoustic pressure wave into a body to be examined, an array of transducers for transducing the acoustic echo that impinges on each of them into a corresponding electrical receive signal, one of a plurality of substantially identical channels for processing the receive signal from each transducer and an intermediate frequency summing point for combining, for each scan line, the processed receive signal

from each of the transducers in the array, the improvement comprising:

a summing delay line causing the processed receive signal for each transducer to arrive at the summing point in time overlapped relationship including

a plurality of delay cells forming the summing delay line in selective sequence, each delay cell consisting of

(a) delay cell input summing means for at least one of (1) a signal derived from the processed receive signal of at least one transducer, (2) an inselected signal, (3) the output of a first adjacent delay cell or (4) the output of a second adjacent delay cell to produce a delay cell summed input signal,

(b) delay cell output switch means, and

(c) at least one discrete delay element connecting the delay cell summed input signal to the delay cell output switch to form a delay cell output, said delay cell output switch selectively connecting the delay cell output to any one of (1) the input summing means of a first adjacent delay cell, or (2) the input summing means of a second adjacent delay cell or (3) an outselection path; and

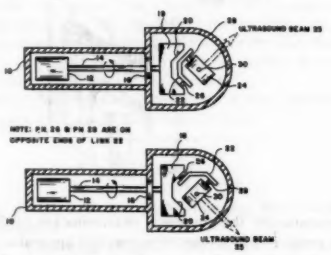
a digital control means for coordinating the position of the output switch means for each delay cell to configure the delay line in a preselected manner for each particular scan line of said transducer array.

4,550,608

OSCILLATING SCANNER AND DRIVE MECHANISM THEREFOR

Ronald C. Carnes, Folsom, and Ted F. Naumann, Jr., Shingle Springs, both of Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 29, 1983, Ser. No. 566,864
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—633 **9 Claims**



5. An ultrasonic sector scanner comprising

a housing,

a drive motor mounted inside of said housing and having a rotating shaft and shaft axis,

a crank member attached to said shaft for rotation therewith,

an oscillating transducer element pivotally attached to said housing and having an axis of oscillation, and

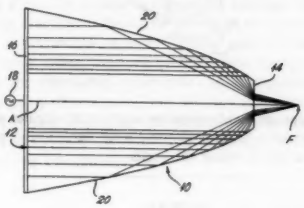
a linkage member attached to said crank member and to said oscillating transducer element for oscillating said transducer element about said axis for oscillation as said shaft and crank member are rotated, said linkage member is attached by a first pin to said crank means, said firt pin having a first axis, and said linkage member is attached by a second pin to said oscillating transducer element, said second pin having a second axis, whereby said shaft axis, said axis of operation, said first axis, and said second axis intersecting at a point.

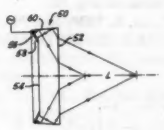
4,550,609

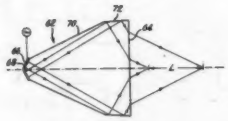
ACOUSTIC LENS

Nicholas D. Johnson, London, England, assignor to National Research Development Corp., London, England

Filed Sep. 16, 1983, Ser. No. 532,913
Claims priority, application United Kingdom, Sep. 23, 1982, 8227166
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—642 **13 Claims**







1. Apparatus for focussing or collimating a beam of high frequency acoustic radiation comprising a solid body of material capable of transmitting acoustic radiation, having a first surface with an electroacoustic transducer coupled thereto to generate acoustic radiation therein, a second surface remote from said first surface for propagation of acoustic radiation between said body and an acoustic transmission medium in contact with said surface and a third internally-reflecting surface cooperable with said first surface to focus said acoustic radiation externally to said body and beyond said second surface.

4,550,610

RESONATOR PRESSURE TRANSDUCER

Errol P. EerNisse, Sandy, Utah, assignor to Quartztronics, Inc., Salt Lake City, Utah

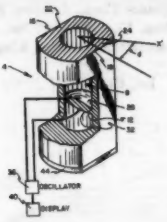
Filed Nov. 28, 1983, Ser. No. 555,822
Int. Cl.⁴ G01L *9/08;* **H01V** *7/00*
U.S. Cl. 73—702 **19 Claims**

1. A resonator pressure transducer comprising:

a generally disc-shaped resonator section;

a housing surrounding the resonator section and joined to the perimeter thereof, said housing having sidewalls which extend generally normal to the plane of the resonator section, with selected portions of the sidewalls being thinner than the remaining portions of the sidewalls so

that when the housing is immersed in a fluid, a non-uniform stress is produced in the resonator section; and



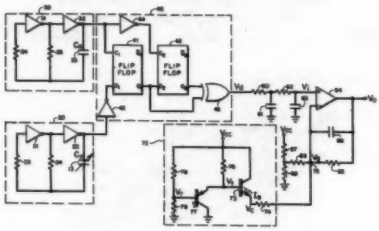
means for causing said resonator section to vibrate, with the frequency of vibration varying with variation in pressure applied to the housing sidewalls.

4,550,611

ELECTRONIC PRESSURE TRANSDUCER

Wlodzimierz S. Czarnocki, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1984, Ser. No. 568,551
Int. Cl.[4] G01L *19/04*
U.S. Cl. 73—708 **27 Claims**



1. An electronic pressure transducer for providing a pressure-indicative output signal indicative of an applied pressure, comprising:

a reference oscillator providing a reference signal having a frequency independent of the applied pressure;

a sensor oscillator providing a pressure signal having a frequency dependent on the applied pressure;

combining means for providing a difference signal having a duty cycle related to the frequency difference between said reference signal and said pressure signal over a relative frequency range of 2:1 to 1:1; and

integrating circuit means responsive to said duty cycle for providing the pressure-indicative output signal.

4,550,612

INTEGRATED PRESSURE SENSOR

Kazuji Yamada; Shigeyuki Kobori; Satoshi Shimada; Ryosaku Kanzawa, all of Hitachi; Ryoichi Kobayashi, Ibaraki, and Hideo Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

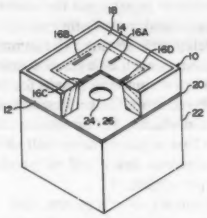
Filed May 31, 1984, Ser. No. 615,524
Claims priority, application Japan, May 31, 1983, 58-97477
Int. Cl.[4] G01L *9/06*
U.S. Cl. 73—727 **7 Claims**

1. An integrated pressure sensor comprising:

a silicon chip having a thin diaphragm portion and a peripheral fixed portion, gauge resistors being formed on said diaphragm portion, said fixed portion being thicker than said diaphragm portion;

a substrate made of the same material as said silicon chip for supporting said silicon chip;

a thin insulating film interposed between said silicon chip and said substrate; and



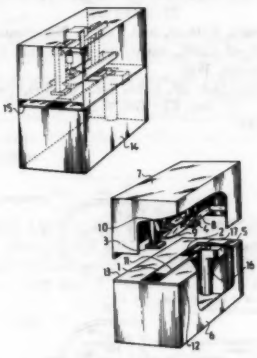
a signal processing circuit formed in the surface of said fixed portion.

4,550,613

APPARATUS FOR AUTOMATIC DETERMINATION OF THE TENSILE STRENGTH PROPERTIES OF A SHEET OF PAPER

Olavi Lehtikoski, Sölvenkatu 8, SF-78300 Varkaus 30, and Martti Nissinen, Kirvesniementie 2, SF-78880 Kuvansi, both of Finland

Filed Dec. 13, 1983, Ser. No. 560,829
Claims priority, application Finland, Dec. 30, 1982, 824510
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—834 **3 Claims**

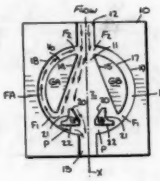


1. Apparatus for the automatic determination of the tensile strength properties of a sheet of paper, said apparatus comprising a substantially flat fixing block of predetermined and uniform width and a pulling block which is displaceable relative to the fixing block in the same plane, a fixing head pressable against the fixing block for holding a sheet of paper therebetween, a pulling head pressable against the pulling block for holding a sheet of paper therebetween, said pulling head being movable along with the pulling block, a measuring device for measuring the tensile strength properties of paper, a cutter means adapted to cut off said sheet of paper a sample blank of standard width as the sheet is positioned between and pressed by the fixing block and fixing head at one end of said sample blank and between and pressed by said pulling block and said pulling head at the other end of said sample blank, said cutter means comprising two parallel blades spaced apart by said width of said fixing block and extending in the direction of said fixing block on opposite sides of said fixing head and said pulling head, and drive means mounted on the blades for pushing said blades towards the two longitudinal sides of the fixing block for cutting a sample blank of said predetermined width.

4,550,614
OSCILLATORY FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Jan. 14, 1985, Ser. No. 691,003
Int. Cl.[4] G01F *1/20*
U.S. Cl. 73—861.19 **10 Claims**



1. An oscillatory flowmeter yielding an output signal whose frequency is a linear function of flow rate, said flowmeter comprising:

A. a meter body having a steering chamber therein, a power nozzle to project a jet stream of the fluid being metered into the chamber, and an output duct in line with the power nozzle to provide a fluid exit from the chamber;

B. twin guides disposed in the chamber on either side of the power nozzle to define an interaction zone, the inner walls of the guides diverging outwardly from the power nozzle, the outer walls of the guides being spaced from the opposing sidewalls of the chamber to define feedback paths, each having an inlet at the downstream end of the related guide and an outlet at the upstream end forming a control nozzle adjacent the power nozzle;

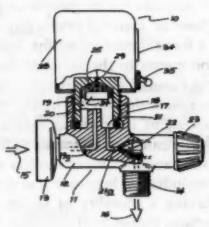
C. twin diverters disposed in the chamber on either side of the output duct, each diverter acting to split the jet stream which is emitted from the power nozzle and attaches itself to the inner wall of the related guide into a control stream which is diverted toward the inlet of the feedback path and an output stream which is directed toward the output duct, the control stream which flows through the feedback path and is discharged from its control nozzle acting in the interaction zone to deflect the incoming jet toward the inner wall of the other guide where the same hydraulic action is repeated, whereby the jet stream is switched alternately from guide to guide; and

D. means to sense the resultant fluidic forces exerted on the diverters to produce said output signal.

4,550,615
FLUID FLOWMETER

Graham C. Grant, P.O. Box 40, Northbridge, New South Wales 2063, Australia

Filed Aug. 29, 1983, Ser. No. 527,326
Claims priority, application Australia, Sep. 6, 1982, PF5752
Int. Cl.[4] G01F *1/20, 1/66*
U.S. Cl. 73—861.21 **8 Claims**

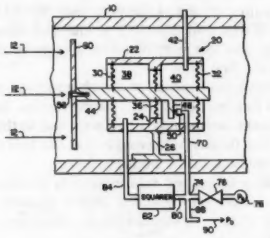


1. A fluid flowmeter comprising a body portion, a chamber within the body portion through which fluid is passed in use of the flowmeter, first and second fluid flow channels in the body portion, the first channel being connectable at one end to a supply of fluid and communicating at its other end with a nozzle which projects into the chamber, the second channel communicating at one end with the chamber and being connectable at its other end to a fluid delivery line, an acousto-electrical transducer located within the chamber and exposed directly to fluid flowing through the chamber and to acoustical energy which is emitted by the fluid, the nozzle being orientated toward the transducer whereby fluid passing into the chamber from the nozzle is caused to impinge on the transducer, the transducer being in the form of a microphone including a vibratable member which provides an electrical output signal when exposed to acoustical energy emitted by the fluid, the vibratable member or casing portion of the transducer being apertured to permit pressure equalisation at opposite faces of said vibratable member, and an indicator in circuit with the transducer for providing indication of the electrical output of the transducer.

4,550,616
PNEUMATIC FLOW STATION

Richard C. Mott, Harwood Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 21, 1983, Ser. No. 534,525
Int. Cl.[4] G01F *1/28*
U.S. Cl. 73—861.74 **4 Claims**



1. A fluid flow measurement system for use in a duct comprising:

force means positioned in the duct to receive the fluid and to produce a first force that varies with the square of the fluid velocity in the duct;

rebalance means including a first chamber having flexible walls connected to said force means and having an input to receive a rebalance pressure which, when applied to the chamber, moves the flexible walls in a direction opposite to the direction the first force is applied, including a second chamber having flexible walls also connected to the force means, the second chamber being exposed to atmospheric pressure, and including squaring means connected to said force means to receive the first force and operable to produce a variable pressure, said squaring means operating on the variable pressure to produce the rebalance pressure which varies with the square of the variable pressure; and

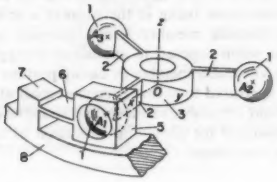
means connecting the squaring means to said first chamber to apply the rebalance force to said first chamber to produce a rebalance force opposing the first force, the variable pressure thereby varying as the square root of the first force and thus varying substantially linearly with the fluid velocity as an output indicative of flow measurement.

4,550,617

MULTI AXIS FORCE AND MOMENTS TRANSDUCER

Bernard Fraignier, Villemomble, and Daniel E. Géry, Saint Remy, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", France

Filed May 4, 1984, Ser. No. 607,262
Claims priority, application France, May 6, 1983, 83 07957
Int. Cl.[4] G01L *5/16*
U.S. Cl. 73—862.04 **21 Claims**



1. A multi-axis force and moment transducer for determining the forces and moments existing between first and second bodies comprising:

(a) a first element attached to the first body, the first element having a first axis;

(b) a second element attached to the second body;

(c) a plurality of housing means disposed about the first element, each of the housing means defining a socket opening with a central axis extending generally perpendicular to the first axis;

(d) a plurality of first relatively thin flexible plates, each having a first end attached to the first element and oriented so as to flex only in a direction generally perpendicular to the first axis;

(e) first attachment means to attach a second end of each of the first flexible plates to a housing means, the first attachment means comprising a ball attached to the second ends of the first flexible plates such that the ball fits within the socket opening in the housing means;

(f) a plurality of second relatively thin flexible plates, each having a first end attached to the second element and oriented so as to flex only in a direction generally parallel to the first axis;

(g) second attachment means to attach a second end of each of the second flexible plates to a housing means; and,

(h) means associated with each plate to determine the force exerted thereon by the flexing caused by relative movement between the two bodies.

4,550,618

TORQUE DETECTOR

Tokio Kohama, Nishio; Hideki Obayashi, Okazaki; Toshikazu Ina, Nukata, and Seiichi Narita, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jun. 15, 1983, Ser. No. 504,425
Claims priority, application Japan, Jun. 17, 1982, 57-104118
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.34 **8 Claims**

1. A torque detector comprising:

a driving member connected to an engine;

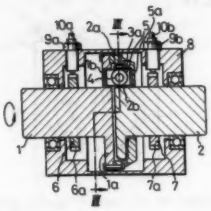
a driven member connected to a load and driven by said driving member to be rotated;

an elastic member for connecting said driving member to said driven member;

a transmission means for varying the rotating speed ratio of said engine to said load, which is provided in said driving member or said driven member;

an angular phase difference detecting means for detecting the angular phase difference between said driving member and said driven member, which is produced due to the deformation of said elastic member;

a rotating speed ratio detecting means for detecting the rotating speed ratio of said engine to said load, which is controlled by said transmission means; and



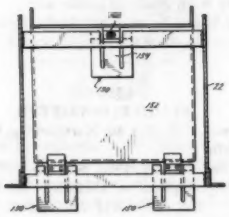
a torque processing means for calculating engine torque and load driving torque from the rotating speed ratio detected by said rotating speed ratio detecting means and the angular phase difference detected by said angular phase difference detecting means.

4,550,619

SUSPENSION FOR A LINEAR FORCE TRANSDUCER

Joseph A. Volk, Jr., Florissant, and Joseph A. Volk, Chesterfield, both of Mo., assignors to Beta II, Incorporated, St. Louis, Mich.

Division of Ser. No. 479,252, Mar. 28, 1983. This application Jun. 27, 1984, Ser. No. 625,120
Int. Cl.[4] G01F *1/30*; G01L *1/04*
U.S. Cl. 73—862.62 **16 Claims**



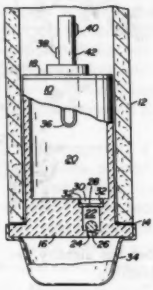
1. In a device to measure the magnitude of a force applied to a surface by a flow of material impacting the surface, the device including a force detection means, and means coupling the force detection means to the surface, the coupling means and force detection means having means to define one or more parallel axes along which the force is measured including a rod means, the improvement comprising means to support the surface, said support means having means to limit movement of the surface to a substantially linear motion along one of the defined axes and including at least one leaf spring, said at least one leaf spring having a plurality of leaves with a first leaf attached to the surface, means to attach said rod means to said first leaf, and another of its leaves attached to the support means so that movement of the surface deflects said first leaf with respect to said other leaf.

4,550,620

END-FILLING SAMPLER FOR MOLTEN METALS

John R. Wiese, Pittsburgh, and Thomas J. Walsh, Butler, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 25, 1983, Ser. No. 555,218
Int. Cl.[4] G01N 1/12
U.S. Cl. 73—864.55 9 Claims



1. An end-fill immersion sampling device for molten metal comprising

a sampler chamber for molten metal,

a passageway through the immersion end of said device for flow of molten metal into said sampler chamber when said device is immersed in molten metal,

gas vent means at the opposite end of said sampler chamber to permit gas to escape from said sampler chamber when said molten metal is flowing into said sampler chamber, and

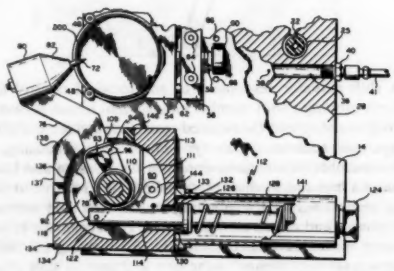
check valve means within said passageway for opening said passageway when said molten metal tends to flow into said sampler chamber and for closing said passageway when said molten metal tends to flow out of said sampler chamber.

4,550,621

CONTAINER PIERCING DEVICE

Elton E. Rush, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 210,504, Nov. 26, 1980. This application Oct. 21, 1983, Ser. No. 544,184
Int. Cl.[4] G05G 17/00
U.S. Cl. 74—2 3 Claims



1. Apparatus comprising:

(a) a support plate;

(b) a dowel extending generally normal from the support plate;

(c) a cam pivotally mounted to the dowel for pivoting from a first position to a second position;

(d) an arm pivotally mounted to the dowel and extending radially past the cam;

said arm pivoting from a first position past the first position of the cam to a second position;

(e) means for biasing the cam toward its first position;

(f) means for biasing the arm toward its second position, wherein the arm and the cam are biased by their respective means in opposite directions;

(g) means cooperating with the arm for engaging the cam, said means for engaging the cam being movable from a first position to engage the cam to a second position to disengage the cam;

(h) means for biasing the means for engaging the cam toward its second position; and

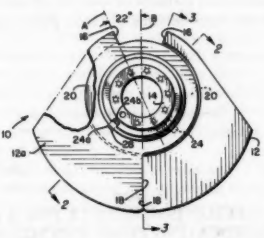
(i) means for restraining the arm in its second position against movement toward its first position when the cam is engaged.

4,550,622

PLURAL-AMPLITUDE VIBRATION ASSEMBLY

David E. La Bonte; Kurt W. Richter, both of Shippensburg, and Robert F. Goehler, Greencastle, all of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 12, 1983, Ser. No. 493,995
Int. Cl.[4] B06B 1/16
U.S. Cl. 74—87 11 Claims



1. A plural-amplitude vibration assembly, for use in vibratory, surface compactors and the like, comprising:

first and second apertured, eccentric weights;

a rotatable shaft in penetration of both of said weights; and

means engaging said shaft retaining said weights on said shaft; wherein

each of said weights has a recessed land formed therein;

said lands are confrontingly nested together in juxtaposition;

one of said weights and said shaft have engaging means interposed therebetween to cause said one weight to rotate in common with said shaft;

the other of said weights is freely rotatable relative to said shaft;

said weights are substantially identical;

said shaft has a given diameter; and

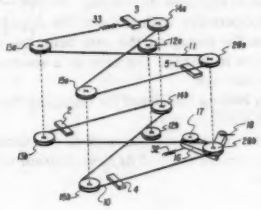
said weights each have a shaft-engaging aperture which has an inside diameter which is slightly greater than said given outside diameter, to define a relative slidable interface between said outside diameter of said shaft and said inside diameters of said apertures.

4,550,623

MOTORIZED CABLE MECHANISM FOR POSITIONING TRACTORS IN A PRINTER

Peter Gysling, Boise, Id., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Oct. 24, 1983, Ser. No. 545,014
Int. Cl.[4] F16H *27/02*
U.S. Cl. 74—89.2 **19 Claims**



1. A drive system for imparting translational motion to a plurality of pairs of elements, the elements of each pair having a fixed relationship with respect to each other, for moving a continuous web element, said drive system comprising:

a support;

drive means fixedly mounted on said support for providing rotational motion;

at least two linking means coupled to the drive means;

at least two pairs of elements slidably coupled to the support for translational motion with respect to said support, each pair of said elements being fixedly attached to a respective one of said linking means; and

a plurality of routing means mounted on said support for routing each of said linking means such that each of said linking means, responsive to rotational motion of the drive means, moves each element of said pair of elements in the same direction and the same distance with respect to said support.

4,550,624

REVERSING MECHANISM MODULE FOR A DOUBLE ACTING RECIPROCATING PUMP AND METHOD FOR REPAIRING THE PUMP

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 320,584, Nov. 12, 1981, Pat. No. 4,436,493, which is a continuation-in-part of Ser. No. 77,544, Sep. 21, 1979, abandoned. This application Oct. 21, 1983, Ser. No. 544,060
Int. Cl.[4] F16H *21/10*; F16K *31/44*
U.S. Cl. 74—110 **16 Claims**

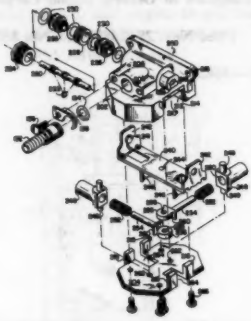
2. An article for use with a double-acting reciprocating pump comprising:

(a) a module housing including first and second separate portions connected together;

(b) a guide slot in said module housing;

(c) a valve actuating member mounted for reciprocating movement within said guide slot back and forth between two end positions, said valve actuating member having a first actuating means extending transversely from said member on one side of said member, said valve actuating member also having a second actuating means on the opposite side of said member; and

(d) snap-acting spring means mounted in said module housing and operatively connected to said valve actuating member for rapidly completing the movement of said member from one of its two end positions to the other after said member has already been moved part way to said other end position.

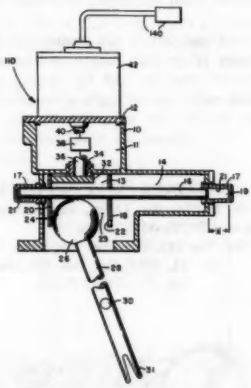


4,550,625

ELECTRICALLY CONTROLLED SHIFT ACTUATOR

George Martin, Lancaster, Ky., and Robert H. Brouksou, Portage, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 27, 1982, Ser. No. 423,921
Int. Cl.[4] F16H *5/06*; B60K *20/10*
U.S. Cl. 74—335 **31 Claims**



1. A shift actuator responsive to an electrical control for selectively moving a shift member engagement means between a selected one of at least two spaced-apart first and second shift positions, said actuator of the type comprising a housing, a rotatable member rotatably mounted on the housing and having at least a first and second rotational position relative to the housing respectively corresponding to the first and second shift positions, and means moveable with respect to the housing having means associated therewith for moving the shift member engagement means to the first and second shift positions in response to rotation of the rotatable member respectively to the first and second rotational positions, said control comprising:

a motor operable to rotate the rotatable member between the first and second rotational positions thereof relative the housing;

first switch means connected to the motor, said first switch means having a first condition and a second condition;

second switch means connected to the motor and to the first switch means, said second switch means having a first condition and a second condition;

third switch means connected to a power supply and to said first and second switch means, said third switch means having a first condition for directing power from the power supply to the motor when the first switch means is in the second condition and the second switch means is in either the first or second condition and having a second condition for directing power from the power supply to the motor when the second switch means is in the first condition and the first switch means is in either the first or second condition;

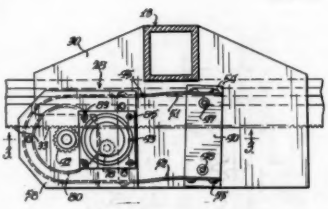
and said rotatable member comprising a cam operable to control the relative conditions of said first, second and third switch means such that said third switch means is in the first condition and said first and second switch means are respectively in said second condition when the shift member engagement means is at the second shift position and to change said second switch means to said first condition to start the motor rotating to move the shift member engagement means to the first shift position and to then change said first switch means to said second condition to stop the motor from rotating and change said first switch means to said first condition and said third switch means to said first condition when the shift member engagement means is at the first shift position and to then change said first switch means to said second condition to start the motor rotating to move the shift member engagement means to the second shift position and to then change the second switch means to the second condition to stop the motor from rotating when the shift member engagement means is at the second shift position.

4,550,626

SERVO-MOTOR ASSEMBLY FOR MACHINE SLIDES

Frans Brouwer, 410 Greenwood Ave., Glencoe, Ill. 60022

Filed Mar. 14, 1983, Ser. No. 475,197
Int. Cl.[4] F16H *55/18, 1/04, 35/06*
U.S. Cl. 74—409 **11 Claims**



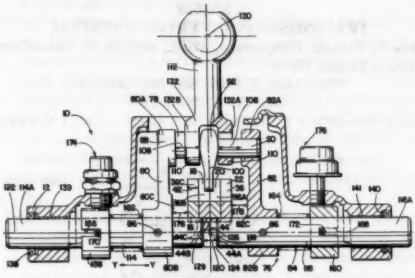
1. A servo-drive for machine slides of the type driven by a rack gear carried by a first machine member and a pinion gear drivingly engaged with the rack gear carried by a second machine member movable relative to the first machine member, comprising: a base member fixed with respect to the second machine member, a servo-motor support transversely movable with respect to the rack having an output shaft rotatably mounted therein for carrying the pinion gear, a servo-motor carried by said servo-motor support and connected to rotate the output shaft and pinion, and means for biasing the pinion against the rack including a generally flat spring interconnecting the fixed base member and the servo-motor support, said generally flat spring supporting the servo-motor support for movement toward and away from the rack gear without any rotary bearings.

4,550,627

TRANSMISSION SHIFTING MECHANISM

Ernst H. Lauer, Kalamazoo, and Joseph D. Reynolds, Climax, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 6, 1982, Ser. No. 447,346
Int. Cl.[4] G05G *5/10, 9/12*
U.S. Cl. 74—475 **24 Claims**



1. A shifting mechanism for a change gear transmission comprising;

a shift mechanism housing mountable to a change gear transmission;

a plurality of substantially parallel generally equal width shift rails mounted in aligned side-by-side relationship for selective axial movement in said housing, each of said shift rails operatively connected to shift elements for engaging and disengaging selected gears, each of said shift rails having an axially nondisplaced neutral position and at least one axially displaced in-gear position, each of said shift rails having means defining a transversely extending shift notch on one of the upper and lower surfaces thereof adapted for engagement by a shift finger and means defining a transversely extending through interlock notch on one of the upper and lower surfaces thereof, all of said shift notches aligning when all of said shift rails are in an axially nondisplaced neutral position, all of said interlock notches aligning when all of said shift rails are in an axially nondisplaced neutral position;

a shift shaft-shift finger assembly mounted in said housing for axial movement along and rotatable movement about an axis extending substantially transverse to the axes of said shift rails, said shift shaft-shift finger assembly comprising a shift shaft mountable in said housing for axial movement along and rotational movement about its axis in said housing, said shift shaft axially slidable within the space partially defined by the peripheral surfaces of said interlock notches of those shift rails in the nondisplaced neutral positions thereof and adapted to interfere with the peripheral surfaces of said interlock notches to prevent substantial axial movement of said shift rails from the axially nondisplaced neutral positions thereof, said shift shaft defining a gap therein having a width greater than the thickness of one shift rail but less than the thickness of two shift rails, said gap permitting axial movement therethrough of a shift rail aligned therewith from the axially nondisplaced position of said shift rail aligned with said gap, said shift shaft-shift finger assembly further comprising a shift finger fixed to said shift shaft for axial movement along and rotational movement about the axis of said shift shaft therewith and having a surface engagable with the shift notch of an aligned shift rail for imparting a selected axial movement to said aligned shift rail, said shift finger aligned with said gap whereby alignment of said shift finger with a selected shift rail will align said gap with said selected shift rail allowing selected axial movement of said selected shift rail while preventing substantial

axial movement of all of the shift rails not aligned with said shift finger from the axially nondisplaced neutral position thereof; and

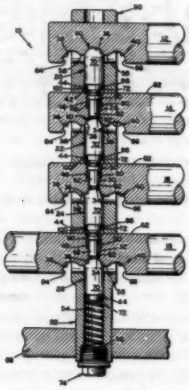
means drivingly attachable to said shift shaft-shift finger assembly to selectively axially move said assembly along the axis of said shift shaft and to selectively rotate said assembly about the axis of said shift shaft.

4,550,628

TRANSMISSION INTERLOCK SYSTEM

James A. Yarnell, Temperance, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 2, 1984, Ser. No. 585,802
Int. Cl.⁴ G05G *5/10*
U.S. Cl. 74—477 **11 Claims**



1. In a transmission including shift rods oriented along parallel axes, said rods selectively movable between axially spaced gear positions, said rods reciprocally slidable relative to each other, said rods each including interlock notches, all except at least one of said rods including a bore extending transversely to said axes, each bore communicating with one of said notches, each bore containing an interlock pin, said transmission further including a plurality of interlocks, each interlock being registrable with the notches on one of said rods, one interlock being disposed between each pair of pins for coaction therewith, and spring means for loading said springs and interlocks together; an improvement comprising said interlocks each defining a pair of large and small diameter coaxially oriented cylindrical ends, wherein small diameter ends are disposed for extension into said pin bores.

4,550,629

CONTINUOUSLY VARIABLE SPEED TRANSMISSION FOR MOTOR VEHICLES

Mutsumi Kawamoto, Aichi, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Aug. 3, 1982, Ser. No. 404,730
Int. Cl.⁴ F16H *57/10*
U.S. Cl. 74—689 **16 Claims**

1. A continuously variable speed transmission for motor vehicles comprising:

a first shaft;

a second shaft parallel to said first shaft;

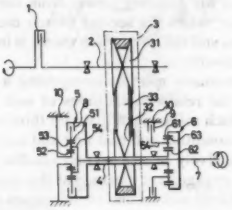
an intermediate shaft disposed side by side and parallel to said first shaft and arranged coaxial with and surrounding said second shaft;

a first variable pitch pulley fixedly mounted to said first shaft for rotation therewith;

a second variable pitch pulley fixedly mounted to said intermediate shaft for rotation therewith;

an endless belt interconnecting said first and second variable pitch pulleys, said pulleys and belt comprising a belt type continuously variable change ratio device;

a forward-drive planetary gear mechanism of a single planetary pinion type disposed on one side of said second variable pitch pulley and mounted on said intermediate shaft and subject to interconnecting said intermediate shaft and said second shaft;



a reverse-drive planetary gear mechanism of a single planetary pinion type disposed on the other side of said second variable pitch pulley and mounted on said intermediate shaft and subject to interconnecting said intermediate shaft and said second shaft; and

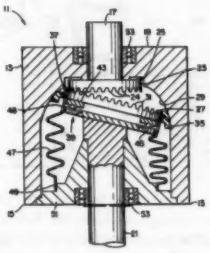
an individual control means provided for each of said forward and reverse drive planetary gear mechanisms for selectively interrupting the rotational transmission of the associated planetary gear mechanism between said intermediate shaft and said second shaft, whereby forward and reverse rotations are selectively provided at said second shaft.

4,550,630

HERMETICALLY SEALED DRIVE

Casimer F. Remus, Tunkhannock, Pa., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 23, 1982, Ser. No. 410,226
Int. Cl.⁴ F16H *1/28, 23/00*; F16J *15/50*
U.S. Cl. 74—800 **6 Claims**



1. In a system having an input driven connection and an output drive connection, one of which connections is located outside of a hermetically sealed volume, and the other of which connections is connected to components in the hermetically sealed volume to allow rotary force to be transferred from outside of the hermetically sealed volume to the components in the hermetically sealed volume, apparatus for connecting the input drive connection to the output drive connection, said apparatus characterized by:

(a) a housing body having a first shaft bore, a first gear bore, an outer bore and a bore connection between the first gear bore and the outer bore;

(b) the bore connection comprising a bore section formed as a smooth spherical segment which converges in the direction of the first shaft bore and diverges in the direction of the outer bore;

(c) a first shaft having a first face gear fixed to the end thereof and coaxial therewith;

(d) a second shaft mounted coaxially with the first shaft and having a first end facing the first gear;

(e) a spherical thrust washer is provided to comply with the spherical segment;

(f) a second face gear which rides against the spherical segment, the second face gear having a different number of teeth than the first gear, the second face gear being mounted to the spherical thrust washer so as to prevent the second face gear from substantially engaging the spherical segment when the second face gear is riding against the spherical segment;

(g) sealing means cooperating with the second face gear to effect a hermetic seal across the housing body the sealing means preventing the second gear from rotating about its axis of symmetry; and

(h) drive means which causes the second face gear to rotationally nutate against the spherical segment, the drive means including a cam on the first end of the second shaft, the cam's cam follower being the second face gear, the rotation of the second shaft causing the cam to nutate the second face gear, and the second face gear's nutation causing the second face gear's teeth to successively engage the first face gear's teeth, wherein

the first shaft is the output drive connection and is located within the hermetically sealed volume and the second shaft is the input drive connection and is located outside of the hermetically sealed volume.

4,550,631

INDEXING SYSTEM OF MACHINE TOOLS AND THE LIKE

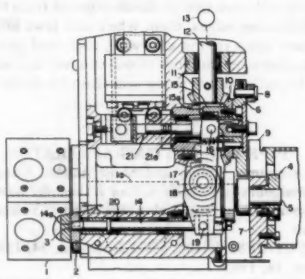
Yoshinori Yamazaki, Koganei, and Tsutomu Ogawa, Fuchu, both of Japan, assignors to Kabushiki Kaisha Miyano Tekkosho, Ueda, Japan

Filed Sep. 27, 1983, Ser. No. 536,356

Claims priority, application Japan, Oct. 6, 1982, 57-176894

Int. Cl.[4] B23B *3/16, 7/04, 29/32, 39/20*

U.S. Cl. 74—822 **3 Claims**



1. An indexing system comprising:

an indexing driven structure, such as the turret of a lathe; a hydraulic motor having an inlet port and an outlet port; a geneva mechanism driven by said motor for causing the indexing driven structure to undergo indexing movement, said geneva mechanism having a driving wheel;

an annular locking cam fixed coaxially to said driving wheel of the geneva mechanism and having an annular cam surface with high and low portions in the axial direction of the driving wheel;

a locking bolt for engaging the indexing driven structure to place and mechanically lock the same in a specific indexing position, said locking bolt being movable so as to be disengaged from the indexing driven structure;

resilient means urging the locking bolt into engagement with the indexing driven structure;

hydraulic actuator means having a plunger to be advanced when the actuator means is operated;

a cam follower interposed between said annular cam surface and said plunger in such a manner that the force of the advancing plunger will cause the cam follower to be pressed against the cam surface;

coupling means connecting said cam follower and said locking bolt in such a manner that when the plunger is advanced the locking bolt is shifted into positive engagement with the indexing driven structure against a reactive counter force from the same, said resilient means exerting such a force to said cam follower by way of said locking bolt and coupling means as to cause the cam follower to be continually pressed against said cam surface; and

hydraulic circuit means including a change-over valve having,

first and second ports at one side thereof and third and fourth ports at the other side thereof, said changeover valve being movable between a first changeover position and second changeover position, a hydraulic pressure source, a hydraulic fluid reservoir, hydraulic pipe means connecting said pressure source to said fourth port of the changeover valve and to said inlet port of the hydraulic motor, a motor exhaust pipe connecting said outlet port of the hydraulic motor to said first port, a single pipe line connecting said second port to said actuator means, and an exhaust conduit connectng said third port of the changeover valve to said reservoir,

said first changeover position of the changeover valve causing said second and fourth ports theeof to communicate with each other whereby hydraulic fluid is allowed to flow from the pressure source to the hydraulic actuator means so as to cause the latter to operate to engage the locking bolt with the indexing driven structure, said first changeover position preventing communicative connection of said first and third ports thereby blocking said motor exhaust pipe so as to stop the motor and therefore the indexing movement,

said second changeover position of the changeover valve causing said first and second ports to communicate with said third port whereby the outlet port of the motor is communicatively connected to the reservoir thereby to allow the motor to rotate and therefore the indexing movement to start and whereby the actuator means is caused to communicate with the reservoir by way of said single pipe line and as a result said high portion of the annular cam surface, which is rotated as a result of the indexing movement, pushes back the plunger via said cam follower thereby to disengage the locking bolt from the indexing driven structure.

4,550,632

KNIFE SHARPENER

Roger Inman, Sheffield, England, assignor to Archant Limited, England

Filed Oct. 28, 1983, Ser. No. 546,272

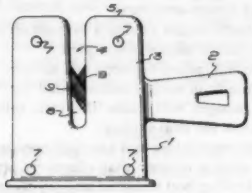
Claims priority, application United Kingdom, Jan. 18, 1983, 8301312

Int. Cl.[4] A01D *3/00;* **B24B** *3/36*

U.S. Cl. 76—86 **2 Claims**

1. A sharpener for blades having a cutting edge comprising two sharpening elements mounted in overlaping V-formation and spring-loaded to each other, said sharpening elements being pivotally mounted at one end such that on pivotal movement of the sharpening elements consequent upon the application of a blade between the sharpening elements, the V-angle between the elements varies dependent upon the depth of

insertion of the blades, said two sharpening elements each being of circular cross-section and each being mounted on a



respective pivotally mounted arm to be freely rotatable on the respective arm.

4,550,633

POWER TIGHTENING DEVICE HAVING DETACHABLE SOCKET UNIT

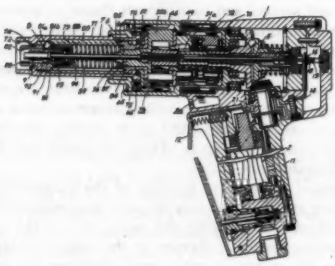
Masahiro Fujita, Sennan, and Yukio Uemura, Yokohama, both of Japan, assignors to Maeda Metal Industries Ltd., Osaka and Nissan Motor Co., Ltd., Kanagawa, both of, Japan

Filed Jun. 26, 1984, Ser. No. 624,549

Claims priority, application Japan, Jun. 27, 1983, 58-99788[U]

Int. Cl.[4] B25B *17/00*

U.S. Cl. 81—56 **4 Claims**



1. A power tool including an inner socket having a bolt tip engaging bore, an outer socket having a nut engaging bore and the inner socket rotatably fitted therein, and an epicyclic train coupled to a drive assembly and having an inner gear case and a planet gear support frame, the outer socket being coupled to the gear case, the inner socket being connected to the support frame, so as to tightly screw a nut on a bolt by torques acting on the two sockets, the power tool being characterized in that the inner socket is formed with a cavity at its base end, the planet gear support being formed with a projection, the inner socket being engagable with or disengageable from the support frame axially thereof and rotatable therewith, a holder main body being formed with a non-circular hole concentrically therewith and rotatably fitted in the front end of the gear case, a bearing plate being disposed on the inner side of the main body rotatably with the gear case and being concentrically formed with a non-circular hole identical with the hole of the main body in shape, the outer socket being provided with a non-circular flange conforming to the shape of the holes of the main body and the bearing plate, the holder main body being provided with an engaging member for softly holding the main body to the bearing plate in a position where the hole of the main body is out of phase with the hole of the bearing plate.

4,550,634

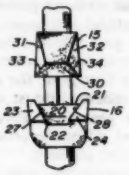
SEAM PULLING TOOL FOR TEARING OUT WELDED SEAMS OF CONTAINERS

Robert W. Speegle, 50 N. Corona Dr., Porterville, Calif. 93257

Filed Apr. 2, 1984, Ser. No. 595,902

Int. Cl.[4] B25B *7/02, 7/22*

U.S. Cl. 81—418 **3 Claims**



1. A seam pulling tool for use, with a selected can having a metal wall with a rectilinear welded side seam, in quality control of can manufacture, including in combination:

a pair of pliers with an upper jaw and a lower jaw,

said lower jaw having a trapezoidal central flat portion having a front and a rear edge and two sides and being wider at the rear edge between said sides than at the front edge, and a vertical side portion extending up from each side of said flat portion, each said side portion having a sharp cutting upper edge, inclined upwardly toward said rear edge,

said upper jaw having a flat surface the same shape and nearly the same size as said central flat portion and having side walls perpendicular to said flat portion, said side walls providing a sharp cutting bottom edge at each side of said flat surface,

the difference in size between said flat portion and said flat surface being only enough to enable engagement of said flat portion and said flat surface against each other when said upper and lower jaws are closed against each other, so that when said jaws are closed said side walls pass closely adjacent to their respective side portions and each said sharp cutting bottom edge moves by said sharp cutting upper edge to provide shearing action that can cut the wall of said selected can on each side of the selected can's side seam at an angle that is wide at the top and narrow toward said seam due to the divergence from front to rear of the cutting edges, then, when said jaws are closed on opposite sides of the can wall, said tool grasps a strip portion between cut lines of said can wall and said tool can then be pulled down along said seam for as far as desired.

4,550,635

PIPE END CUTTING APPARATUS

Kiyoshi Kanayama, Ebina, and Shoji Asano, Atsugi, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo and Nippon Kokan Koji Kabushiki Kaisha, Yokohama, both of, Japan

PCT No. PCT/JP82/00408, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983

PCT Filed Oct. 15, 1982, Ser. No. 509,444

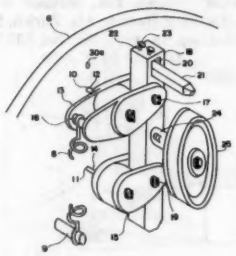
Claims priority, application Japan, Oct. 16, 1981, 56-152804

Int. Cl.[4] B23B *5/16*

U.S. Cl. 82—4 C **3 Claims**

1. A pipe end cutting apparatus comprising: a support arm adapted to be positioned adjacent to the end of a pipe; a support shaft carried by said support arm; setting means for setting a pipe to be beveled coaxially with respect to the support shaft; force transmitting means rotatably supported by said support shaft; machining means mounted on said force transmitting means and facing an end portion of the pipe to be beveled; driving means for moving the machining means about the pipe axis and adjacent the pipe end; wherein said machining means includes a main arm having spaced ends, a longitudinal axis

positioned in a plane transverse to the axis of the pipe, and having a pivot point intermediate its ends, said main arm pivotally supported on said force transmitting means to be pivoted in a plane about said pivot point, an auxiliary arm spaced from and parallel to said main arm, said auxiliary arm having an end thereof supported at a predetermined distance from the pivot point of said main arm to be pivoted in the pivot plane of said main arm, a machining tool holder supported at one end of said main arm and at an end of said auxiliary arm allowing the main arm and the auxiliary arm to pivot with their longitudinal axes



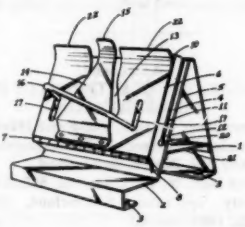
parallel to each other, a machining tool mounted on said machining tool holder and having a cutting edge carried on said machining tool holder and movable circumferentially along the inner surface of said pipe, guide means on said toolholder for maintaining the cutting edge of said machining tool at the pipe end, and means mounted on the other end of said main arm for urging said control means toward the inner surface of the pipe, whereby a parallelogram linkage is defined by said main arm, said auxiliary arm and said machining tool holder to minimize the change in the cutting angle between the machining tool and the pipe end for a range of pipe diameters.

4,550,636

SLICING APPARATUS

Marc Josselson, San Diego, Calif., and Doug Henderson, Carrollton, Tex., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Jun. 4, 1984, Ser. No. 617,009
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 83—743 **26 Claims**



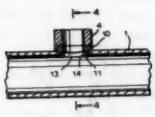
1. A slicing apparatus on a support stand comprising:
a. a holder for an item to be sliced connected to said stand, said holder having a first surface which comprises a flat stationary plate for receiving one surface of the item to be sliced, and a second surface spaced opposite to said plate which is movably connected to said holder to provide a movable cover for said holder so as the movable cover is opened, an item to be sliced can be placed in the holder and as the cover is closed, the cover holds the item to be sliced against the stationary plate;
b. a support means based between the first and second surfaces of said holder to support the item to be sliced which includes a slicer blade receiving means for a blade to be inserted through the support means and slice the item, wherein said blade receiving means include a stop means to control the depth of the cut by the blade through the item.

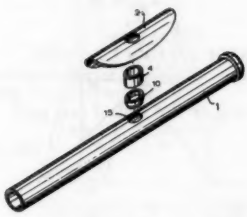
4,550,637

FLUTE HEADJOINTS HAVING REPLACEABLE LIP PLATES AND A METHOD OF REPLICATING SAME

Sanford Drelinger, 13 Park Cir., White Plains, N.Y. 10601

Filed Feb. 23, 1983, Ser. No. 468,894
Int. Cl.[4] G10D *7/02*
U.S. Cl. 84—384 **16 Claims**





1. In combination:
a flute headjoint tube having an alignment hold through the side wall of the headjoint tube; and
a tube section dimensioned to closely fit within said alignment hole, said tube section having an opening defining a flute blow hole bottom for opening into said headjoint tube when said tube section is inserted in said alignment hole, and said tube section having a surface surrounding the blow hole bottom and defining an entire blow hold undercut surface with said flute headjoint tube free of undercut surface.

4,550,638

PORTABLE KEYBOARD-TYPE MUSICAL INSTRUMENT

Kenkichi Kaneko; Takeshi Hattori; Kensaku Hakamata; Satoru Hayashi; Takayuki Goshima, and Masakazu Matsumoto, all of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Filed May 20, 1983, Ser. No. 496,433
Claims priority, application Japan, May 31, 1982, 57-80368
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—431 **6 Claims**

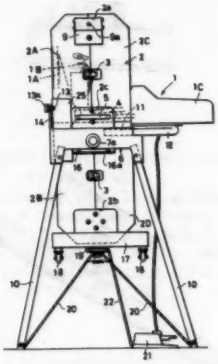
1. In a portable, keyboard-type musical instrument having a main frame, a keyboard pivotally connected to the main frame and movable between an outwardly extended operative position and a retracted storage position, and frame members providing legs and which are attachable to the musical instrument in an extended supporting position or in a retracted storage position, the improvement comprising:
a mounting plate at each end of said frame member and rigidly secured thereto, each said mounting plate including means for positioning and locating a mounting member;
each said mounting member carrying supporting legs for

said musical instrument, and each including an elongate inverted U-shaped clamp for the reception of a keyboard support member, each said mounting member being securable to the associated said mounting plate by screw means extending through said clamp of said mounting member;

each said keyboard support member comprising an elongate U-shaped tubular member providing two arms and having one arm positioned within said U-shaped clamp and clamped therein upon appropriate actuation of said screw means;

means on said frame member for supporting an internally threaded other arm of each said keyboard support member in a keyboard supporting position; and,

an upstanding bracket on each said mounting member having other screw means carried thereby;



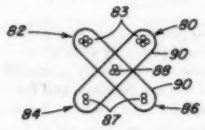
said keyboard support members, on relaxation of said U-shaped clamps, being movable axially to withdraw them from engagement with said support means on said main frame, then being swingable about the axis of said one arm, then being movable axially towards the associated upstanding bracket of the associated mounting member to move said internally threaded other arm into registration with said other screw means of said associated upstanding bracket, and then being rigidly securable to the associated mounting member by threading the associated said other screw means into said internally threaded other arm of said keyboard support member, and, by then retightening the screw means associated with the associated U-shaped clamp.

4,550,639

SHAPED MECHANICAL COMPRESSION PACKING

George B. Champlin, Stoneham, Mass., assignor to The Seal Company of New England, Manchester, N.H.

Filed Dec. 17, 1982, Ser. No. 450,517
Int. Cl.[4] D04C *1/06, 1/12*
U.S. Cl. 87—7 **4 Claims**



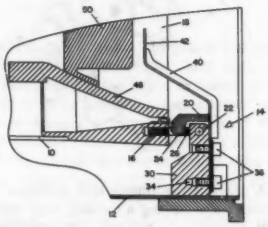
1. In braided mechanical compression packing of square or rectangular cross-section, the combination of a plurality of axial warp yarns placed in a predetermined non-symmetrical pattern such that additional corner fill exists adjacent the outer corners of the packing material vis a vis the amount of corner fill adjacent the inner corners of the packing material, and carrier yarns being braided about said warp yarns, whereby parallelism of opposite cross-sectional sides of said completed packing is maintained as said packing is wrapped about a cylindrical surface.

4,550,640

MISSILE CANISTER RESTRAINT DEVICE

Robert R. Harter, Apopka, Fla., assignor to Werkzeugmaschinenfabrik Oerlikon-Buehrle AG, Zurich, Switzerland

Filed Sep. 16, 1983, Ser. No. 532,743
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.806 **6 Claims**



3. A springless, no-load missile restraint arrangement involving substantially no compromise of the aerodynamic configuration of the missile, for releasing a rocket propelled missile from its canister promptly after ignition of its rocket motor, and the expulsion of a nozzle seal from its rocket motor nozzle, said release arrangement comprising an elongate anchor means of small diameter secured to the aft end of the missile, to which releasable restraint means are attached, said restraint means comprising a base member mounted in an aft portion of the canister, adjacent the aft end of the missile, a pivotable member supported upon said base member, and having first and second positions, said pivotable member having a nose portion arranged, when the pivotable member is in its first position, to engage said elongate anchor member, said pivotable member moving to its second position, to bring about the release of the anchor member, upon expulsion of the seal from the nozzle of the rocket motor, and the seal striking a deformable component operatively associated with said pivotable member.

4,550,641

SAFETY APPARATUS IN EXTERNALLY POWERED FIRING WEAPON

Werner Bruderer; Hans Brieger, and Ernst Hürlemann, all of Zurich, Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Nov. 28, 1983, Ser. No. 555,689
Claims priority, application Switzerland, Dec. 8, 1982, 7127/82; Jan. 28, 1983, 489/83
Int. Cl.[4] F41F *11/00*
U.S. Cl. 89—12 **10 Claims**

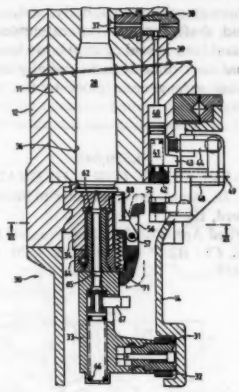
1. A safety apparatus for an externally powered weapon including a weapon barrel and into which cartridges are insertable which may be subject to ignition delay, said safety apparatus comprising:

a breechblock positively reciprocating between a forwardmost position and a rearmost position;

means for locking said breechblock to said weapon barrel in said forwardmost position;

said breechblock comprising a breechblock head and a breechblock carrier which are operatively coupled to each other; and

decoupling means for decoupling said breechblock head from said breechblock carrier in said forwardmost position in which said breechblock head is locked to said weapon barrel in response to said ignition delay condition.

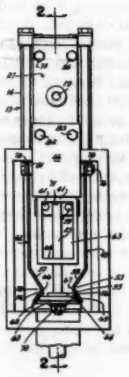


4,550,642

FLUID PRESSURE OPERATED PISTON ENGINE ASSEMBLY

Alfred Langer, Norcross, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Nov. 2, 1984, Ser. No. 667,543
Int. Cl.⁴ F01L *31/02*
U.S. Cl. 91—346 **2 Claims**



1. A fluid pressure operated piston engine assembly comprising:

a fluid pressure operated piston engine including a piston chamber, a piston reciprocable in the chamber, and a drive shaft attached to the piston and reciprocable therewith through a drive shaft stroke having a first end and a second end;

fluid valve means for coupling fluid under pressure to alternative portions of the piston chamber, including a valve rod translatable to (a) a first position in which the valve means is operable to couple fluid under pressure to a first portion of the piston chamber, tending to move the drive shaft toward the second end of its stroke and (b) a second position in which the valve means is operable to couple fluid under pressure to a second portion of the piston chamber, tending to move the drive shaft toward the first end of its stroke;

a drive frame, mounted for limited translation on the valve rod, including a pair of opposed flat springs disposed on opposite sides of the valve rod, each spring having a contoured portion with (a) a first spring surface applying a force to the valve rod when the drive frame is in a first position relative to the valve rod to forcibly urge the valve rod into its first position and (b) a second spring surface applying a force to the valve rod when the drive frame is in a second position relative to the valve rod to forcibly urge the valve rod into its second position; and

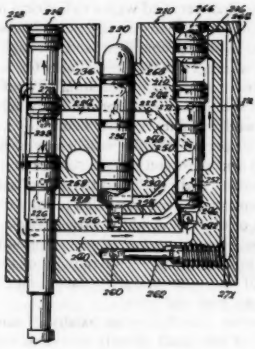
means for (a) coupling the piston engine drive shaft to the drive frame as the drive shaft approaches the first end of its stroke so that the drive frame is moved to its first position relative to the valve rod and (b) coupling the piston engine drive shaft to the drive frame as the drive shaft approaches the second end of its stroke so that the drive frame is moved to its second position relative to the valve rod, whereby, as the drive shaft approaches its end of its stroke, fluid under pressure is coupled to a portion of the piston chamber to effect reversal of the direction of travel of the drive shaft.

4,550,643

FASTENER DRIVING TOOL

Julius W. Schwartzenberger, Chicago, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed May 2, 1984, Ser. No. 606,153
Int. Cl.⁴ F15B *11/15*
U.S. Cl. 91—356 **12 Claims**



1. In a tool for driving fasteners into a workpiece using a pressurized fluid motor for actuating a fastener driving means, comprising:

a manually actuated trigger valve means,

a safety means actuated by placing the tool adjacent the workpiece,

fluid actuated valve means controlled by the trigger valve means and the safety means for controlling the application of pressurized fluid to the fluid motor, and

control means interconnecting said trigger valve means and said safety means selectively actuable to a first mode preventing operation of the fluid actuated valve means unless said safety means is first actuated followed by the actuation of the trigger valve means whereupon the sequence must be repeated for repeated operation of said fluid actuated valve means and to a second mode allowing repeated operation of the fluid actuated valve means upon repeated actuation of said trigger valve means after first actuating said safety means.

4,550,644

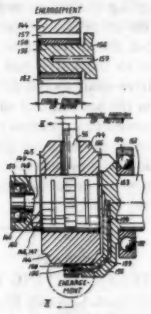
DRIVE SHAFT ARRANGEMENT TO REDUCE LEAKAGE IN FLUID MACHINES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 235,058, Feb. 17, 1981, abandoned, which is a division of Ser. No. 910,809, May 30, 1978, abandoned, which is a division of Ser. No. 911,246, May 31, 1978, abandoned. This application Jan. 31, 1984, Ser. No. 575,622

Int. Cl.[4] F01B *13/06*

U.S. Cl. 91—486 2 Claims



1. A fluid machine which has in a housing an around a substantially concentrically located controlbody with a cylindrical outer face revolving rotor with fluid intaking and expelling working chambers and with a cylindrical inner face which bears and seals substantially on said outer face while fluid flows through said working chambers and through said inner and outer faces; wherein a shaft is revolvably borne in said housing with the axis of said shaft substantially coinciding with the extension of the axis of said control body while said shaft is coupled to said rotor to revolve said rotor and said shaft in unison and to permit relative radial movement of said rotor relatively to said shaft and to said control body;

wherein axially and parallel to the axis of said rotor extending reception slots are prevailed in the axially seen medial portion of said rotor which extend axially to at least one end of said medial portion of said rotor and provide in said medial portion of said rotor radially of the medial center points of said outer and inner faces plane reception faces on the walls of said slots;

wherein arms extend from an axially of said rotor located portion of said shaft radially outwards endwards of said rotor to bend radially outwards of a portion of said shaft towards said rotor and partially substantially axially along said rotor to end in fingers of suitable size to be receivable in said slots while drive faces are provided on said fingers which are at least partially parallel to said reception faces;

wherein said fingers are received in said slots and at least one of said drive faces presses against at least one of said reception faces when said rotor drives said shaft to revolve and when said shaft drives said rotor to revolve;

wherein said drive faces and reception faces slide along each other when the axes of said control body and of said rotor are distanced from each other and said sliding permits said rotor to be borne with its inner face on said outer face of said control body around which it revolves regardless of the accuratenes of the coincidence of the axes of said control body and said rotor;

whereby said rotor obtains the ability to revolve in response to fluid between said inner and outer faces slightly eccentrically around said control body to reduce leakage between said inner and said outer faces by locally narrowing the distance between said inner face and said outer face in the high pressure zone between said inner and outer face, and;

wherein said control body has a centric bore which extends axially through said control body, and,

wherein said shaft has an axial extension which extends through said bore in said control body into at least the rear end of said control body to be radially borne in a respective bearing arrangement close to the rear end of said control body.

4,550,645

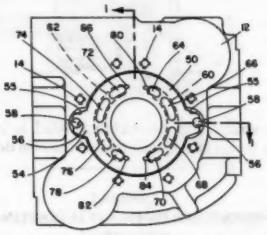
THIN VALVE PLATE FOR A HYDRAULIC UNIT

Richard Beck, Jr., Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 27, 1984, Ser. No. 605,019

Int. Cl.[4] B23P *15/60*; B21K *1/20, 1/24*

U.S. Cl. 91—499 24 Claims



1. A valve plate for a hydraulic unit comprising a housing having inlet and outlet ports therein, a cylinder block having cylinders therein and being rotatable relative to the housing, each of said cylinders having a cylinder port, said cylinder ports serially communicating with said inlet and outlet ports, pistons slidable in said cylinders, displacement setting means for reciprocating said pistons within said cylinders, and valve means positioned between said cylinder block and said inlet and outlet ports in said housing to selectively provide fluid communication between said housing ports and said cylinders in said cylinder block as said cylinder block rotates, said valve means including; a valve plate secured against rotation relative to said housing, said valve plate having a plurality of valve plate ports radially positioned so as to serially communicate with said cylinder ports, at least one of said valve plate ports having means at the leading edge thereof for increasing communication between the approaching cylinder ports and the associated one of said inlet and outlet ports, said means to increase communication including a slot extending through said valve plate, said valve plate having a thickness not substantially greater than 0.100 inch and less than the maximum width of said slot, and a housing portion abuts the side of said valve plate opposite said cylinder block to form the bottom of said slot.

4,550,646

METHOD AND ARRANGEMENT FOR RETAINING CYLINDER LINERS IN A RECIPROCATING PUMP

John E. Miller, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 4, 1984, Ser. No. 678,189

Int. Cl.[4] F16J *10/00*

U.S. Cl. 92—128 12 Claims

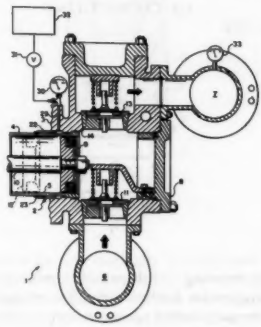
1. In a reciprocating piston pump including a frame having a bore and a tubular piston cylinder liner mounted within the bore supported by the frame, the improvement comprising a seal and retaining arrangement securing the cylinder liner to the frame, wherein:

said frame includes an annular mounting face at one end of said bore and a counterbore at the other end of the bore of

a predetermined diameter relative to the diameter of the bore defining an annular ridge extending from said mounting face;

said cylinder liner is received within said bore in sliding engagement with said annular ridge and is provided with an annular shoulder abutting said mounting face;

a removable annular sleeve is releasably secured about said cylinder liner and is slidingly received within said counterbore to form an annular chamber between the juncture of said annular ridge and the cylinder liner and said sleeve;



a passage is provided in the frame communicating with said annular chamber; and

a source of pressurized fluid is connected with said passage for introducing fluid into said annular chamber at a predetermined pressure to prevent the ingress of the fluid being conveyed by the pump into the chamber while maintaining a differential force against the sleeve to secure the cylinder liner within the frame.

4,550,647

PISTON PIN AND PISTON, NOTABLY FOR AN INTERNAL COMBUSTION ENGINE, EQUIPPED WITH SAID PIN

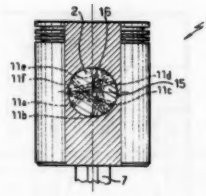
Jean-Paul Coulin, Montmorency, France, assignor to Societe d'Etudes de Machines Thermiques (SEMT), St. Denis, France

Continuation of Ser. No. 497,557, May 24, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,600

Claims priority, application France, May 28, 1982, 82 09424

Int. Cl.[4] F01B *31/10;* **F16J** *1/08*

U.S. Cl. 92—157 **20 Claims**



1. A cylindrical piston pin for pivotally connecting a piston to the piston end of a connecting rod, the piston pin having a first end, a second end, a cylindrical outer surface, and a plurality of straight internal passages, at least one of said passages having one end opening through the cylindrical outer surface of the pin in a region midway between the ends of the pin and another end opening through the cylindrical outer surface of the pin at a location axially spaced from the opening of the one end of the passage toward the first end of the pin, wherein the improvement comprises:

the piston pin has a completely solid substantially cylindrical and coaxial central portion, the central portion having a diameter of at least one tenth of the diameter of the piston pin, and

said passages are provided in a peripheral portion of the piston so as to avoid said solid central portion.

4,550,648

ATTIC VENTILATION SYSTEM

Jon R. Eagle, 10625 Vessey Rd., Bloomington, Minn. 55437

Filed Jul. 11, 1983, Ser. No. 512,780

Int. Cl.[4] F24F *13/18*

U.S. Cl. 98—37 **4 Claims**

1. A frame for securing a screen over a ventilation opening having a perimeter, said opening in a building, said frame comprising:

a pair of elongated screen mounting members and one or more rigid cross members holding said mounting members in a substantially parallel relationship, said mounting members and said cross members each including a plurality of longitudinally extended bendable mounting tab means for securing said mounting members substantially to said opening perimeter, and, said mounting members and said cross members are formed from sheet metal and wherein said mounting members and said cross members are secured to said opening perimeter by manually bending said tab means down on the inside of the opening to clamp said frame thereto, and each of said mounting members and one of said cross members further including on a side generally opposite said tab means, a longitudinal screen engaging slot and, at least one of said cross members connects corresponding ends of said parallel mounting members and includes a slot for slideably receiving the end of a screen.

4,550,649

PROCESS AND APPARATUS FOR REDUCING THE TEMPERATURE GRADIENT IN BUILDINGS

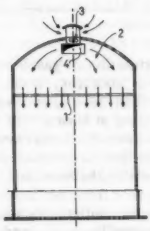
Marco Zambolin, via Gassendi 13, 20155 Milan, Italy

Filed Jul. 15, 1982, Ser. No. 398,629

Claims priority, application Italy, Jul. 31, 1982, 23283 A/81

Int. Cl.[4] F24F *9/00*

U.S. Cl. 98—39.1 **7 Claims**



1. Process for diminished thermal dissipation air-conditioning of the open interior space of a building such as an industrial building, having side walls covered over by a roofing to form such open interior space and which open interior space defines an upper zone adjacent the roofing and a lower zone therebelow, so as to maintain the lower zone in generally existing

heated condition to the extent of diminishing thermal dissipation of heat therefrom through the roofing, which comprises

forcing outside air into the building through an inlet opening at the roofing and then laterally and tangentially in laminar flow in generally evenly spreading fashion along the adjacent inner surface of the roofing at a higher pressure relative to the existing pressure of the inside air in the open interior space and at a lower temperature relative to the existing temperature of said inside air and sufficiently to distribute the incoming outside air throughout the upper zone and to form an intervening insulating layer of stratified relatively overpressured outside air generally completely filling the upper zone and defining a thermally downwardly flowing generally horizontal uniformly distributed fluid barrier horizontally separating the inside air in the remainder of the open interior space in the lower zone therebelow from the roofing thereabove, for diminishing upward thermal flow of adjacent portions of the inside air from the lower zone to the roofing and otherwise resultant thermal dissipation of the existing heat content of the inside air through the roofing, and for permitting in turn generally uniformly distributed downward thermal flow of the outside air from the upper zone into the lower zone and into contact with the adjacent portions of the inside air to absorb heat content therefrom.

4,550,650

HOOD FOR THE EXTRACTION OF GASES, VAPORS AND SUSPENDED MATTER

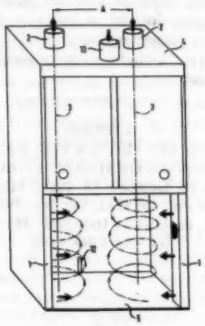
Wolf J. Denner; Andreas Biernacki, and Günter Breitschwerdt, all of Stuttgart, Fed. Rep. of Germany, assignors to Waldner Laboreinrichtungen GmbH & Co., Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,817

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208622

Int. Cl.[4] F24F *9/00*

U.S. Cl. 98—115.3 **14 Claims**



1. Hood for the extraction of gases, vapors, and suspended matter, particularly a laboratory hood, comprising a hood casing, a supply air feed device, at least one suction outlet, supply air being supplied at least partly from the ambient air through a connection from the hood casing to the external air, wherein the supply air feed device includes at least one nozzle ledge that is lcoated within the hood and has a discharge outlet directed in the plane of a front suction inlet of the hood, and wherein each said suction outlet is located within said hood in association with a respective said nozzle ledge in a manner producing a vortex air flow therebetween in such a way that air is extracted by the suction outlet in the direction of the axis of the vortex flow produced, characterized in that two suction outlets (2) are arranged on the cover plate (4), whilst two nozzle ledges (1), arranged vertically, on the side walls are provided and the discharge outlets of said ledges are directed counter to one another, the discharge outlets of the ledges and suction outlets being arranged with respect to each other in such a way as to produce a pair of oppositely rotating, vertical axis, tubular vortexes.

4,550,651

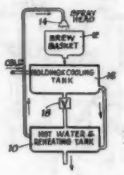
BATCH-BREWING COFFEE SYSTEM

Joel Haynes, Tarzana, Calif., assignor to Richard B. Mindlin, Prairie Village, Kans.

Filed Nov. 19, 1982, Ser. No. 442,947

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—279 **16 Claims**



1. A coffee brewing and dispensing system comprising:

(a) a brewing basket for holding coffee grounds and producing hot brewed coffee upon the introduction of hot water therein;

(b) a holding and cooling tank for receiving and cooling a substantial volume of hot brewed coffee from said basket and storing same at a reduced temperature available for use on demand; said tank including cooling means for cooling said coffee; and

(c) means for draining off and quickly heating small volumes of cooled coffee from said tank as needed.

4,550,652

COFFEE MAKER

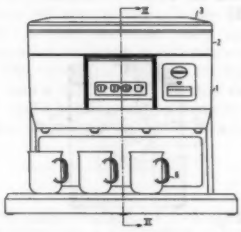
Artur F. Da Silva, Sao Paulo, Brazil, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1983, Ser. No. 543,746

Claims priority, application Brazil, Oct. 26, 1982, 8206233

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—279 **4 Claims**

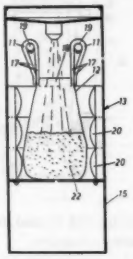


1. A coffee maker which comprises a housing; a filtering device for arrangement in the housing, said filtering device having a single outlet; and a distributor for positioning in the housing below the filtering device, said distributor having a plurality of inlets and an equal number of outlets and a duct system interposed between said inlets and said outlets; the filtering device being positionable in said housing with its outlet sequentially in contact with each distributor inlet; and the duct system being so formed that it connects each distributor inlet in sequence with the distributor outlets.

4,550,653
APPARATUS FOR MAKING FOOD PRODUCTS

Gunnar Hedenberg, Grundsund, Sweden, assignor to Heden-Team A.G., Triesenberg, Liechtenstein

Filed Apr. 1, 1983, Ser. No. 481,154
Claims priority, application Sweden, Dec. 28, 1982, 8207438
Int. Cl.[4] A47J 27/62
U.S. Cl. 99—348 17 Claims

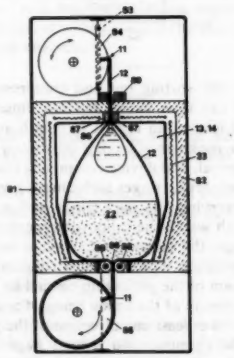


1. An apparatus for automatically making food products in piece form from dough-like substances comprising a dough preparation station containing holding means adapted to be affixed to the opening of a flexible sealable bag containing the necessary substantially dry ingredients for the dough-like substance; liquid means for introducing a predetermined amount of liquid into the bag; kneading means for mechanically working the liquid and dry ingredients in said bag; and transfer means for transferring the kneaded dough-like substance to a heat treating station which contains a receptacle and heating means whereby the kneaded doughlike substance is treated; the operation of the aforementioned elements being all predetermined with program means and therefore the apparatus will make the food product and such product will be in the fresh prepared state at the desired time.

4,550,654
APPARATUS FOR AUTOMATIC PREPARATION OF FOOD PRODUCTS SUCH AS BREAD, CAKES AND THE LIKE

Gunnar Hedenberg, Grundsund, Sweden, assignor to Heden Team A.G., Triesenberg, Liechtenstein

Continuation-in-part of Ser. No. 481,154, Apr. 1, 1983,. This application Dec. 27, 1983, Ser. No. 565,398
Int. Cl.[4] A47J 37/01
U.S. Cl. 99—348 8 Claims

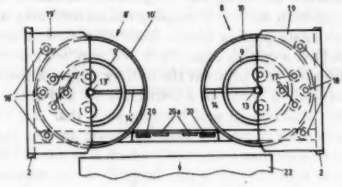


1. An apparatus for automatically making food products in piece form from dough-like substances comprising a housing containing holding means adapted to be affixed to either end of a flexible sealable bag containing the ingredients for the dough-like substance, and a dough preparation station having two slit openings; kneading means for mechanically working the ingredients in said bag, said kneading means including the holding means and slit openings at each end of said bag, the bag being attached to the holding means and passing through the slit openings, and means for creating relative oscillating movement between the bag and the slit openings so that the ingredients are kneaded into a dough-like substance; and a heat treating station in said housing whereby the kneaded dough-like substance is treated; the operation of the aforementioned elements being all predetermined with program means and therefore the apparatus will make the food product and such product will be in the fresh prepared state at the desired time.

4,550,655
APPARATUS FOR MAKING WAFER BLOCKS

Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Jul. 16, 1984, Ser. No. 631,391
Claims priority, application Austria, Aug. 1, 1983, 2785/83
Int. Cl.[4] A21D 13/00; A23G 3/00
U.S. Cl. 99—450.4 12 Claims



1. In apparatus for assembling coated wafer sheets to form a wafer block, comprising

two laterally spaced apart helical conveyors rotatable about respective parallel, substantially vertical axes of rotation and arranged to receive on one side on a first level successive individual wafer sheets coated on their top side,

drive means for rotating said helical conveyors about said axes of rotation in such opposite senses that said helical conveyors move each of said wafer sheets thus received in a predetermined direction to travel toward the opposite side of said helical conveyors and raise said wafer sheet above said first level, and

stop means disposed on said opposite side of said helical conveyors and movable between operative and inoperative positions, said stop means in said operative position being arranged to engage each of said wafer sheets on said helical conveyors during the rotation thereof so that said helical conveyors are operable to raise each of said wafer sheets engaging said stop means to a second level and join said wafer sheet to an overlying wafer sheet previously disposed on said second level and thus to assemble a plurality of said wafer sheets in a wafer block, and said stop means in said inoperative position being arranged to permit said helical conveyors to deliver said wafer block on said second level on said opposite side of said helical conveyors,

the improvement comprising

at least two parallel helical wire flights constituting each one of said helical conveyors and surrounding the axis of rotation of the helical conveyor, the helical wire flights of each conveyor being radially spaced apart with respect to said axis, and

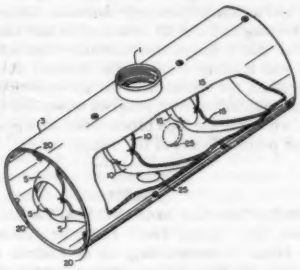
said helical flights of said helical conveyors defining a common imaginary surface supporting each of said wafer sheets.

4,550,656

VEGETABLE PEELER

Norbert A. Kirk, 1458 West Belle Plaine, Chicago, Ill. 60613

Filed Aug. 30, 1984, Ser. No. 645,758
Int. Cl.[4] A23N *7/00*; A47J *17/00*
U.S. Cl. 99—590 **4 Claims**



1. A vegetable peeler, comprising:

an elongate housing having at least one drain hole;

a plurality of sets of cooperating peeling blades mounted in said housing, said sets of peeling blades being spaced from an adjacent set along the longitudinal direction of said housing, each said set of peeling blades including at least two elongate peeling blades made of a flexible material which have a cutting edge at one end disposed centrally of said housing and adjacent the cutting edges of the others of said peeling blades of a respective set and at the other end are attached to said housing such that said cutting edges of a set of peeling blades provide an area therebetween smaller than a vegetable which is received therebetween in order to peel a thin layer from the vegetable as the vegetable is moved longitudinally through said housing and said adjacent cutting blades of a set are forced apart; and

a means mounted on said housing for immovably attaching said housing to a water faucet and for directing water flowing out of the faucet through said housing whereby vegetable peels produced by said sets of peeling blades are washed out of said housing.

4,550,657

BALING CHAMBER ASSEMBLY

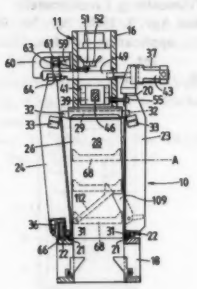
Donald W. Van Doorn; James B. Hawkins; Francis W. Carpenter, III; Robert E. Lange, and Tommy W. Webb, 2021 Coventry Dr., all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Oct. 18, 1984, Ser. No. 662,226
Int. Cl.[4] B30B *15/16*
U.S. Cl. 100—43 **10 Claims**

1. In an up-packing baler having a supporting frame and a movable platen for compressing fibers into a bale:

(a) a baling chamber adapted to receive said movable platen and in part defined by four rigid upright doors with each of said doors being pivotally supported along its lower edge by said supporting frame so that its upper portion is movable inwardly and outwardly relative to said chamber;

(b) means responsive to the compressive force exerted on said fibers by said movable platen for decreasing the lateral pressure exerted on said fibers by said doors; and



(c) means for displacing one of said doors for removing said bale from said baling chamber.

4,550,658

DEVICE FOR SORTING AND COMPRESSING PACKAGINGS, PRINCIPALLY BEVERAGE CANS, IN SEVERAL STAGES

Sten Trolle, Skansgränd 7, Ystad, Sweden

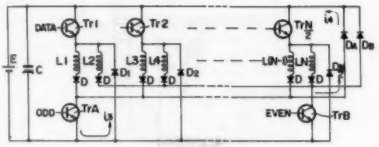
PCT No. PCT/SE82/00259, § 371 Date Apr. 14, 1983, § 102(e) Date Apr. 14, 1983, PCT Pub. No. WO83/00643, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 16, 1982, Ser. No. 492,028
Claims priority, application Sweden, Aug. 18, 1981, 8104892
Int. Cl.[4] B30B *15/30*; B07C *5/34*
U.S. Cl. 100—215 **9 Claims**

1. A device for sorting out and compressing packagings, principally of can type having overall dimensions within a predetermined interval in regard to length and diameter, for example, from packagings having dimension deviating from within said interval, said device comprising two sorting stages, one of said two sorting stages including a pivoted supporting member for carrying the packagings and a frame with an opening through which the supporting member is movable to the second stage, the second sorting stage including pressing members cooperating with the supporting member to effect axial compression of the packaging carried by said supporting member, the opening of the frame being of a size which limits the dimensions in at least one direction of the packaging passing through the opening, said second stage being provided with a second opening through which compressed packagings pass, whereby the second opening maximizes the axial length of the compressed packagings which pass through the second opening and are thereby sorted out.

4,550,659
HAMMER DRIVING CIRCUIT FOR A DOT SYSTEM LINE PRINTER

Nobuki Yamanaga, Iruma, Japan, assignor to Ye Data Inc., Tokyo, Japan

Continuation of Ser. No. 333,619, Dec. 22, 1981, abandoned. This application May 22, 1984, Ser. No. 613,015
Claims priority, application Japan, Jan. 6, 1981, 56-85
Int. Cl.⁴ B41J *3/10*
U.S. Cl. 101—93.04 **3 Claims**



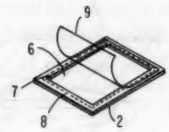
1. A hammer driving circuit for a dot system line printer, said printer having a plurality of hammers which are controlled by an electromagnet means including hammer driving coils and which are arranged in a row on a carriage, printing being effected while simultaneously shifting said hammers, wherein said hammers are divided into (n+1) interspersed groups which are arranged such that two hammers from one group are separated by one hammer from each of said other groups, wherein n is a positive integer, and the hammers of all but one of said groups are arranged so as to be displaced from a position in said row that they would be in if all of said hammers were arranged such that adjacent hammers in said row were spaced apart by equal distances, and wherein one end of the hammer driving coils of the same group are respectively connected to a negative terminal of a DC driving power source through an anti-inhibit diode and group operated electrical switches, and wherein the other end of each of said hammer driving coils is connected to a positive terminal of said DC driving power source through a data operated electrical switch, and wherein fly-wheel diodes are respectively connected to parallel with each series circuit comprising said hammer driving coils, said anti-inhibit diode and said group operated electrical switches; and wherein each of said group operated electrical switches are driven once in a pulse repetition period of each of said hammer driving circuits by a first pulse driving signal having a pulse width which is less than or equal to 1/(n+1) times its pulse repetition period and said data operated electrical switches are selectively driven as necessary by a second pulse driving signal having a pulse width which is less than that of said first pulse driving signal and having a pulse repetition period which is equal thereto so as to thereby print said desired characters.

4,550,660
STENCIL

Morio Sato, and Tatsuya Igawa, both of Kanagawa, Japan, assignors to Pilot Man-Nen-Hisu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,979
Claims priority, application Japan, Oct. 8, 1982, 57-176405; Dec. 28, 1982, 57-200779[U]
Int. Cl.⁴ B41N *1/24*
U.S. Cl. 101—128.21 **5 Claims**

1. A stencil, comprising:
a porous support; and
a masking film formed on the support, wherein the masking film consists of a water-insoluble polymer selected from the group consisting of:
(a) a homopolymer of diethylaminoethyl methacrylate,
(b) a homopolymer of tertiary aminoalkyl acrylate,
(c) a homopolymer of 2-vinylpyridine,
(d) a homopolymer of 4-vinylpyridine,
(e) a copolymer of dimethylaminoethyl methacrylate and at least one monoethylenic monomer,
(f) a copolymer of tertiary aminoalkyl acrylate and a monoethylenic monomer,
(g) a copolymer of 4-vinylpyridine and a monoethylenic monomer,

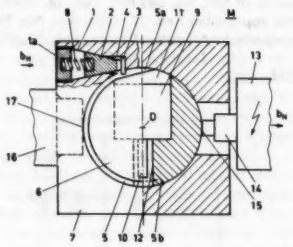


(h) a copolymer of 2-vinylpyridine and a monoethylenic monomer, and
(i) a copolymer of 4-vinylpyridine and 2-vinylpyridine and a monoethylenic monomer, wherein said water-insoluble polymer is one which can be made soluble in water or an aqueous solution upon being contacted with an acid.

4,550,661
SAFETY DEVICE FOR AMMUNITION

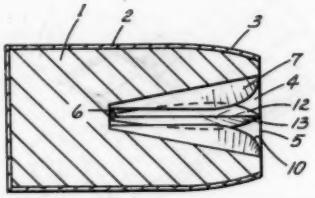
Robert Rehmann, Neerach, Switzerland, assignor to Ems-Inventa AG, Switzerland

Continuation-in-part of Ser. No. 355,877, Mar. 8, 1982, abandoned. This application Sep. 14, 1983, Ser. No. 532,200
Claims priority, application Switzerland, Sep. 16, 1982, 5481/82
Int. Cl.⁴ F42C *15/29*
U.S. Cl. 102—251 **10 Claims**



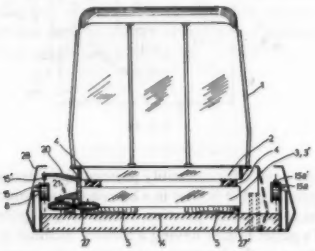
1. A safety device for releasibly preventing undesired movement of a primer pellet holder in a housing of a projectile from an unarmed to an armed position, comprising a groove along an edge of a pellet holder having a locking member at one end thereof, a bore in the housing intersecting said groove of the pellet holder, said bore having a longitudinal axis parallel to an expected direction of acceleration of the projectile and being conical over at least a part of its length, a bolt slideably mounted for longitudinal movement in said bore, said bolt having a corresponding conical shape over at least a part of its length such that the bolt is capable of transverse as well as well as longitudinal movement in said bore, whereby said bolt remains operable under acceleration forces that are transverse to the expected direction of acceleration, said bolt further having a projection at one end thereof for projecting into said groove for engagement with said locking member at the end of said groove to maintain the pellet holder in an unarmed position, and means normally urging said bolt into said groove, said bolt being movable against the force of said urging means to remove the projection from said groove and release the pellet holder to the armed position in response to the expected acceleration forces upon firing of said projectile.

4,550,662
EXPANDING PROJECTILES
Thomas J. Burczynski, 508 Johnson Hollow Rd., R.D. 1, Millport, N.Y. 14864
Filed May 3, 1978, Ser. No. 902,487
Int. Cl.[4] F42B *11/10*
U.S. Cl. 102—509 9 Claims



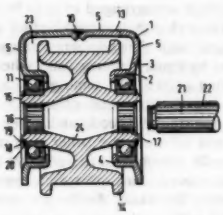
1. A bullet having a central body of malleable material including an ogival end in which is provided an integral open cavity of generally frusto-conical form, a series of rib members extending longitudinally and radially inwardly in said cavity, integral with the body and spaced circumferentially therein, said rib members being formed to split and thereafter concentrate forces from incoming fluidic materials to effect expansion of the cavity and thereby flatten the ogival walls upon penetration of a target area.

4,550,663
TRANSPORTATION SYSTEM HAVING A CABLE DRAWN VEHICLE
Guy DeViaris, Neuilly, France, assignor to Otis Elevator Company, Farmington, Conn.
Continuation of Ser. No. 349,890, Feb. 18, 1982, abandoned.
This application Feb. 27, 1984, Ser. No. 584,069
Claims priority, application France, Feb. 27, 1981, 81 03998
Int. Cl.[4] B61C *11/02*
U.S. Cl. 104—119 1 Claim



1. A transportation system comprising:
two vehicles pivotally attached about a horizontal axis for climbing articulation and having air cushion means underneath for suspending the vehicles by an air cushion effect;
a guideway having a smooth, uninterrupted flat surface, defined as an air cushion effect area, upon which the air cushion effect operates;
a motor-driven cable disposed in the guideway, outside of the air cushion effect area, for propelling the vehicles, wherein the cable is a closed loop, having a first part that propels the vehicles and a second part vertically displaced from the first part that travels in a direction opposite to the direction of the vehicles;
an arm disposed on at least one of the vehicles for attaching to the cable;
a rail disposed in the guideway, outside of the air cushion effect area, for guiding the vehicles;
a pinch roller arrangement disposed on the vehicles, for engaging the rail; and
wherein the cable is supported vertically by vertical sheaves in straight sections of the guideway and is supported both vertically and horizontally by inclined sheaves in curved sections of the guideway.

4,550,664
TRACK WHEEL BLOCK
Harald Bitsch, Witten; Klaus Donner, Hagen; Heinz Hasselmann, Hagen-Emst, and Rainer Horbach, Witten, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Nov. 26, 1984, Ser. No. 674,489
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134750
Int. Cl.[4] B66C *23/04*; B61D *1/00*
U.S. Cl. 105—180 5 Claims



1. A track wheel block comprising:
(a) a track wheel having a lateral riding surface;
(b) said track wheel having a central hollow hub with an external cylindrical surface extending laterally beyond said track riding surface;
(c) a pair of roller bearings means rotatively supporting said cylindrical surface of said hollow hub;
(d) means for retaining said roller bearings means fixed with respect to said hub;
(e) a bearing box comprised of two substantially equal sized wall means welded together, said bearing box having front, back, sides and top surfaces that substantially enclose a significant portion of said track wheel;
(f) recesses mounted in each of said side surfaces of said wall means and adapted to receive said bearing means;
(g) a toothed driving gear, said hollow hub including an interior cylindrical surface with teeth for receiving said toothed driving gear to drive said track wheel;
(h) said roller bearing retaining means including annular slots in said external cylindrical surface of said hollow hub and removable snap rings which fit within said slots;
(i) a space is provided between said track riding surface and the inside walls of said bearing box sufficient to allow lateral shifting of said track wheel when one of said roller bearing retaining means is removed; and
(j) a plurality of bores in the respective surfaces of said bearing box to enable said bearing box to be selectively connected to another element.

4,550,665

BOTTOM DISCHARGE HOPPER STRUCTURES

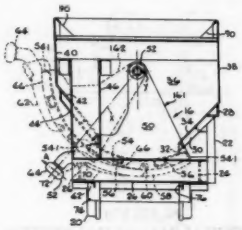
Cornelis Brouwer, Potchefstroom, South Africa, assignor to Rotaque (Proprietary) Limited, Potchefstroom, South Africa

Continuation of Ser. No. 902,319, May 3, 1978, abandoned. This application Mar. 1, 1984, Ser. No. 583,494

Claims priority, application South Africa, May 4, 1977, 77/2681

Int. Cl.⁴ B61D *7/30, 7/04, 7/18*

U.S. Cl. 105—241.2 **8 Claims**



1. A bottom discharge hopper rail car comprising a hopper body mounted on a chassis and a door pivotally mounted on the body, the chassis including wheels rotatable about axes extending in the transverse direction of the car, the body having a pair of inclined, downwardly converging side walls spaced apart in said transverse direction of the car, the longitudinally extending lower edges of the side walls defining a discharge opening from the body, the angle of inclination of one side wall with respect to horizontal being different to the angle of inclination of the other side wall with respect to horizontal, and the door being displaceable between a position in which it closes said opening and a position in which it is spaced from said opening to permit discharge of the contents of said body.

4,550,666

EQUIPMENT STAND

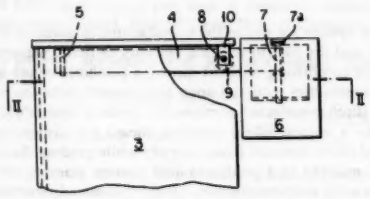
Rudolf Svoboda, Ottokar-Kernstock-Str. 17, A 3100, St. Pölten, Austria, assignor to Firma Svoboda Entwicklung AG, St. Pölten, Austria

Filed May 11, 1983, Ser. No. 493,645

Claims priority, application Austria, May 11, 1982, 1847/82

Int. Cl.⁴ A47B *57/00*

U.S. Cl. 108—96 **18 Claims**



1. A data-processor stand, comprising:

a base;

a vertically adjustable support mounted on said base;

a first generally rectangular platform affixed to said support for receiving a component of a data processor;

an elongated link pivotally connected to said support beneath said first platform at an articulation proximal to one edge of said first platform;

a second platform adapted to receive another component of said data processor and pivotally connected to said link, said link extending beyond an opposite edge of said first platform; and

height-adjustment means engaging said link for raising and lowering said second platform relative to said first platform while holding said second platform generally in the region of said opposite edge.

4,550,667

SAFE HAVING CONCEALED HINGES

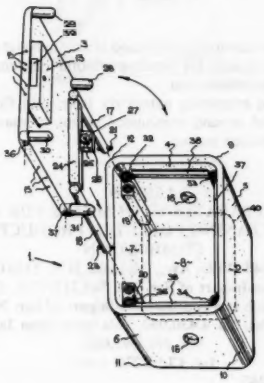
Grahame A. Meyers, 29 Rondelay Dr., Castle Hill, N.S.W. 2154, Australia

Filed Jul. 25, 1983, Ser. No. 516,895

Claims priority, application Australia, Jul. 28, 1982, PF5090

Int. Cl.⁴ E05D *7/14;* **E05G** *1/00*

U.S. Cl. 109—70 **4 Claims**



1. A safe comprising a body defining a chamber and a door therefor, sidewalls of said body being formed from a sheet of mild steel roll-formed and welding into tubular configuration, a rear wall of said body being a mild steel plate welded into place to thereby provide a substantially unitary construction of the said body, having rounded corners; an elongated block secured to the inside face of said door; at least two slide bars the ends of which are pivotally affixed to said elongated block and which slidingly extend through co-operating bores in associated slide channels on the inside of said body, the elongated block carrying a stop means to limit the inward movement of the door when closed and detents on the free ends of said slide bars permitting limited movement of the said door to and away from said body; a plurality of mild steel registering pegs projecting perpendicularly from the said inside face of said door; a co-operating plurality of registering tubes on the inside of the sidewalls of said body, each registering peg being receivable within a respective one of said co-operating registering tubes so that the front face of the safe when closed is flush; and a locking mechanism for the door.

4,550,668

COMBUSTOR UNIT FOR WOODBURNING STOVE

Carl F. Piontkowski, 38 Ridge Dr., Old Saybrook, Conn. 06475

Filed Jul. 1, 1983, Ser. No. 509,794

Int. Cl.⁴ F23B *5/00;* **B01D** *46/42*

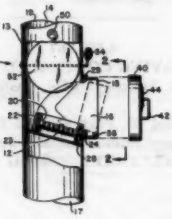
U.S. Cl. 110—210 **18 Claims**

1. A combustor unit for a wood stove comprising:

a flue assembly defining an exhaust passageway having an axis and an access passageway having an axis which intersects the exhaust passageway axis at an angle, the junction of said passageways defining a plane;

combustor means pivotally mounted in said flue assembly, said combustor means being pivotal between a combustion

position wherein said combustor means is positioned across said exhaust passageway and an open position wherein said combustor means is positioned substantially within said access passageway;



a seat means interiorly positioned in said exhaust passageway to define a stop for limiting pivotal movement of said combustor means; and

crank means extending exteriorly from said flue assembly and affixed to said combustor means to manually pivot said combustor means.

4,550,669

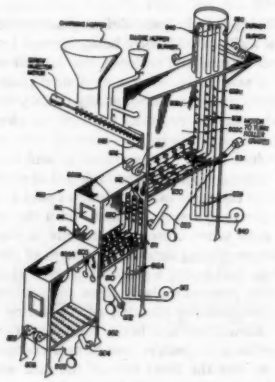
BURNING APPARATUS WITH MEANS FOR HEATING AND CLEANING POLLUTED PRODUCTS OF COMBUSTION

Sam Foresto, 243 Willis Ave., Mineola, N.Y. 11501

Continuation-in-part of Ser. No. 541,217, Oct. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 404,665, Aug. 3, 1982, Pat. No. 4,430,950. This application Jan. 15, 1985, Ser. No. 691,686

Int. Cl.[4] F23G *5/00*

U.S. Cl. 110—245 **22 Claims**



1. Apparatus for cleaning gases within which pollutants are entrained and which gases are produced from burning material such as fuel, waste material and the like comprising:

at least one combustion chamber, the combustion area of said combustion chamber being defined by wall means for enclosing the same including a top;

means for retaining burning material in said combustion chamber up to a level below said top;

flue tube means including at least one tube extending substantially below the level to which material to be burned in said chamber is retained;

one end of said at least one tube comprising means for communication with a source of polluted gases produced by burning material;

said flue tube means intermediate its ends comprising means for conducting such polluted gases through said flue tube means within the material being burned in said combustion chamber and for directly transferring heat between the material being burned in said chamber and the polluted gases conducted through said tube means;

the other end of said flue tube means comprising means for exhausting gases conducted through said flue tube means;

said flue tube means including means for direct fluid communication between the material being burned in said chamber and the conducted gases.

4,550,670

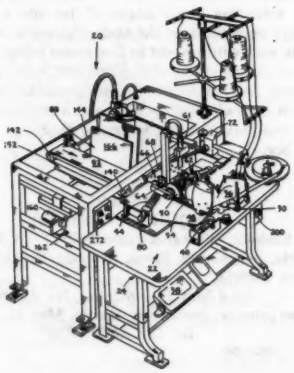
MATERIAL HANDLING SYSTEM

Kenneth J. Thompson, Lexington; Joel C. Rosenquist, Kernersville, and Wayne G. Foster, Advance, all of N.C., assignors to Consolidated Foods Corporation, Winston-Salem, N.C.

Filed Jan. 12, 1983, Ser. No. 457,457

Int. Cl.[4] D05B *19/00*

U.S. Cl. 112—121.11 **8 Claims**



1. A system for use in the manufacture of garment components, and the like, in which a plurality of fabric materials are utilized comprising: support means, a machine having sewing instrumentalities mounted upon said support means to sequentially stitch preselected portions of a series of first fabric materials to a second fabric material, means for dispensing said second fabric material from a supply while guiding the second fabric material in a predetermined manner prior to reaching said sewing instrumentalities, chopper means downstream of said sewing instrumentalities for selectively severing portions of said second fabric materials to form discrete garment components, each garment component comprising a first fabric material having selected portions sewn to said second fabric material, said chopper means including angularly disposed blade means traversing said second fabric material for severing simultaneously two portions of said second fabric material, means for feeding said second fabric material to said chopper means and means for vertically stacking said garment components, said stacking means including elevator means for positioning the top of a stack of garment components at a selected position.

4,550,671

MATERIAL PRESSER DEVICE FOR A SEWING MACHINE

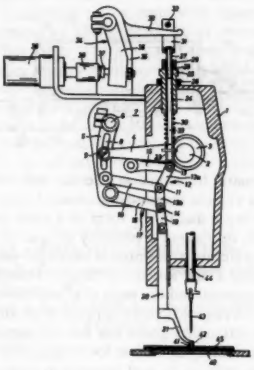
Albert Dusch, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,696

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333046

Int. Cl.[4] D05B *27/04, 29/02*

U.S. Cl. 112—235 **4 Claims**



1. A material presser device for a sewing machine having a rotatable main shaft operably driving a reciprocatable needle, comprising a presser bar having a presser foot engageable with the material workpiece, a rocking lever driven by the shaft, a four joint knee-joint connected to said rocking lever and having one joint end connected to said presser and an opposite joint end, a rod bushing mounted on the sewing machine adjacent said rocking lever, and having an abutment adjacent one end, a rod slidably mounted in said bushing having one end connected to said opposite knee joint end, said rod having a further abutment engageable with said abutment of said bushing for stopping motion of said rod at a selected position toward said presser bar, and spring means biasing said rod toward said presser bar.

4,550,672

THREAD-HOLDING APPARATUS FOR BUTTONHOLE MACHINE

Eberhard Kastrup, Bielefeld, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,198

Claims priority, application Fed. Rep. of Germany, May 4, 1983, 8313114

Int. Cl.[4] D05B *65/02, 53/00*

U.S. Cl. 112—293 **10 Claims**

1. In combination with a buttonhole machine having:

a support head;

a stitching needle for a needle thread displaceably mounted on the support head; and

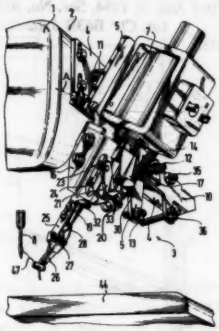
means for cutting the needle thread after a stitching operation and forming thereon a free end extending laterally from the needle; a thread-holding device comprising:

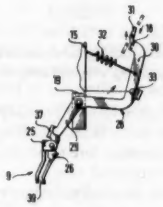
a support plate pivoted on the head;

a thread clip having a pair of jaws displaceable between a closed position engaging each other for holding the thread and an open position for releasing it;

means including an actuator on the support plate and carrying the thread clip for moving same vertically between an upper position spaced laterally relatively far from the needle and a lower position laterally relatively close to the needle; and

control means connected to the clip and to the actuator for moving the clip from the open to the closed position while moving it from the upper to the lower position after a stitching operation to grasp the free end of the cut thread adjacent the needle.





4,550,673

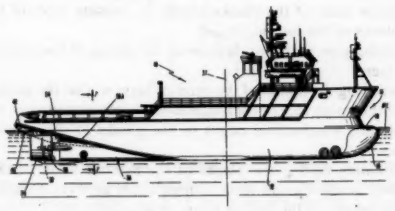
HULL CONSTRUCTION FOR SEAGOING VESSELS

Sigurdur Ingvason, Gördesvagen 31, 43080 Hovås, Sweden

Filed Jun. 2, 1983, Ser. No. 500,359

Int. Cl.[4] B63B *1/06, 1/08*

U.S. Cl. 114—56 **23 Claims**



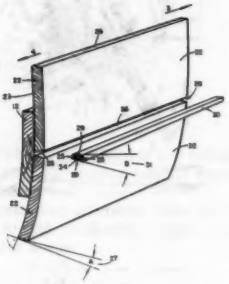
1. A seagoing vessel comprising a hull having side walls which converge forwardly to define a bow, and a forwardly projecting bulb at said bow, said bulb including an upper periphery exposed above the water surface when the vessel is stationary and in a fully loaded condition, said bulb including side walls which curve divergingly downwardly and outwardly from said upper periphery of said bulb to a location defining a maximum width of said bulb and then curve convergingly downwardly and inwardly to a bottom of said bulb, said maximum width of said bulb extending from a rear end of said bulb to a location adjacent a front end of said bulb, said bow extending downwardly and rearwardly from a deck of said vessel to a location above said bulb and then extending forwardly and downwardly to said rear end of said bulb.

4,550,674

BOAT HULL PLANKING METHOD

Kazimierz Zatek, 19 Forest St., So. Weymouth, Mass. 02190

Filed Aug. 3, 1984, Ser. No. 637,511
Int. Cl.[4] B63B 5/02
U.S. Cl. 114—358 7 Claims



1. A method of constructing a wooden boat hull with fore and aft ends and containing ribs defining its framework, comprising the steps of:

arranging as an interior layer a plurality of wooden planks with outside and inside faces, and longitudinal edges in a longitudinally extending fore to aft direction, perpendicular to and outside the hull ribs;

applying glue to the longitudinal edges of the planks of the interior layer;

abutting the longitudinal edges of the planks of the interior layer;

attaching the planks of the interior layer to the hull so that the inside faces of the planks are positioned against the hull ribs;

applying glue to the outside faces of the planks of the interior layer;

arranging as an exterior layer a plurality of wooden planks with outside and inside faces and beveled longitudinal edges in a longitudinally extending fore to aft direction perpendicular to the hull ribs and positioned such that the inside faces of the planks adjoin the outside faces of the planks of the interior layer;

applying glue to the inside faces of the planks of the exterior layer;

positioning the planks of the exterior layer so that the middle of the inside face of each is intermediately placed over the abutted longitudinal edges of the planks of the interior layer;

positioning further the planks of the exterior layer so that their beveled edges form a longitudinal groove extending the length of the hull in a fore to aft direction;

attaching the planks of the exterior layer through the interior layer to the hull ribs;

applying glue to the longitudinal grooves formed by the beveled edges of the planks of the exterior layer;

forcing longitudinal splines with a width slightly greater than the width of the longitudinal grooves into said grooves so that the splines are flush with the outside faces of the planks of the exterior layer;

clamping the splines, interior and exterior planks until the glue sets and hardens;

repeating the above steps until the entire hull is covered with an interior layer of wooden planks and an exterior layer of planks with splines forced into the grooves formed by the longitudinal edges of the planks of the exterior layer; and

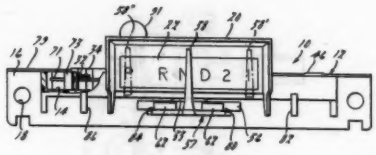
applying a sealer over the completed hull.

4,550,675

SELF-ADJUSTING SHIFT INDICATOR FOR AUTOMATIC TRANSMISSION

Jere R. Lansinger, Bloomfield Hills; George D. Dorr, Troy; Paul L. Farago, Royal Oak, and Gerald A. Miller, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 31, 1983, Ser. No. 480,975
Int. Cl.[4] G09F 9/40
U.S. Cl. 116—28.1 3 Claims



1. An automatic transmission selector indicator mechanism for use with a vehicle transmission control system comprising a housing having a dial in the form of a plate member associated therewith displaying a plurality of spaced indicia corresponding to different transmission settings, said plurality of indicia including a first low drive range terminal indicia and a second park terminal indicia each at a respective extreme end of the dial, a carriage assembly supported on the housing in a longitudinally extending guide slot having parallel side edges, said carriage assembly operative for longitudinal movement in said guide slot relative to said housing in opposite directions between first and second stop means on said housing, said carriage assembly comprising a carrier member and an indicator member, said indicator member in the form of a rectangularly shaped pad disposed in a horizontal plane beneath said housing guide slot, said pad having its upper surface formed with a plurality of opposed inwardly chamfered guide tabs laterally spaced to define a chamber therebetween, said carrier member formed with an upper head section and a lower rectangularly shaped sled, said sled having each of its longitudinal side edges outwardly sloped complementary to its associated inwardly chamfered guide tabs thereby providing interlocking scarf-like engagement relatively slidable surfaces therebetween, such that carrier member may slide in either longitudinal direction in said channel relative to said indicator member upon said indicator member contacting respective ones of said first or second stop means, a resilient spring clip interposed between said sled and said pad for biasing said sled and said pad engaging surfaces into frictional engagement to frictionally oppose longitudinal sliding movement of said indicator member relative to said carrier member, such that said carrier and indicator members are adapted for conjoint longitudinal movement between said first and second stop means, said pointer adapted to be aligned, respectively, with either said first or second terminal indicia upon said pad contacting respective ones of said first and second stop means, a coil spring on said housing with its principal axis disposed horizontally for movement in a direction parallel to said guide slot, said spring having one end connected adjacent one end of said housing and its other end supporting a pulley for rotation about a substantially vertical axis, flexible cable means including first and second cable sections disposed in a common horizontal plane including said coil spring principal axis, said first cable section secured between one end of said carrier member upper head portion and the other end of said housing, said first cable section having a first bight portion return-looped around said pulley and a second bight portion return-looped around a housing arcuate reel, such that the tension force of said coil spring urging said pulley toward said housing one end, means for securing said second cable section between the other end of said head portion and said selector lever assembly on the vehicle, whereby said pulley travels a predetermined longitudinal distance less than the longitudinal travel of said pointer between its two extreme indexed stop positions causing said coil

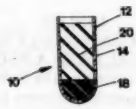
spring to be always maintained under a tension load force, said carriage assembly movable in one longitudinal direction between said housing first and second stop means in response to rotary movement of said lever between its park and low drive range positions, such that upon said pad contacting said first stop means the tension load force of said coil spring overcoming the force of said resilient spring clip, whereby said carrier member is free to slip in said one direction relative to said indicator member by means of said engaging surfaces until said lever places the transmission into its first low drive range position, and whereby upon said carriage assembly being moved in the opposite direction by reverse movement of said lever said pad contacting said second stop means such that continued movement of the selector lever overcoming the resilient spring clip force, whereby said carrier member is free to slip in said other longitudinal direction relative to said indicator member until movement of said lever puts the transmission into its second park position, said indicator mechanism causing said pointer to be automatically aligned, respectively, with each said low drive range and park terminal indicia each time said lever is cycled between its low drive range and park positions.

4,550,676

ELAPSED TIME INDICATOR

Alan W. Francis, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 25, 1983, Ser. No. 525,928
Int. Cl.[4] G01D *21/00*
U.S. Cl. 116—206 **17 Claims**



1. An indicator to signal the passage of a predetermined, approximate time, comprising:

flowable colorant indicator means; and

means enclosing said indicator means, at least a portion of said enclosure means consisting of a substance adapted to volatilize during passage of the predetermined approximate time to release said indicator means from said enclosure means thus providing an indication of the passage of the predetermined approximate time;

said flowable colorant indicator means being intermixed with and held in a sublimable core substance to define a core, said core being disposed within said enclosure means.

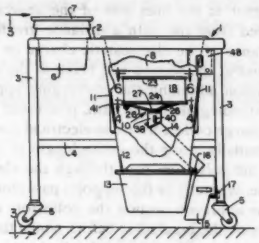
4,550,677

SIFTER FOR BREADING APPARATUS

Vernon E. Reese, Tulsa, Okla., and Roger A. Schwierking, Tipp City, Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed Sep. 21, 1984, Ser. No. 653,721
Int. Cl.[4] B05C *19/00, 11/10*
U.S. Cl. 118—31 **15 Claims**

1. A sifter for separating reusable breading from dough balls formed as an incident of a breading operation, said sifter comprising a foraminous cylindrical basket having a downwardly tapered conical bottom, an opening at center of said conical bottom, a pair of spaced-apart concentric annular walls surrounding said opening and projecting upwardly from the conical bottom of said basket, a plurality of spaced-apart openings in each of said annular wall extending upwardly from the bottom edges of said walls, the openings in one of said annular walls being offset circumferentially with respect to the openings in the other of said annular walls, and a cover at the upper ends of said annular walls enclosing the area of the bottom of the basket lying within the confines of the outermost annular wall.

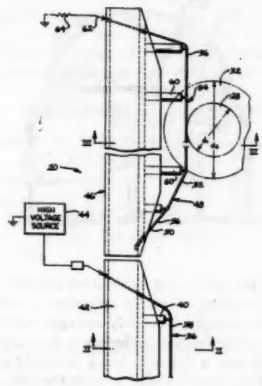


4,550,678

APPARATUS FOR REMOVING AN ELECTROSTATIC CHARGE FROM A CHARGE COLLECTOR

Gary L. Demeny, Delavan, and Robert G. Smead, St. Charles, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 15, 1984, Ser. No. 660,684
Int. Cl.[4] B05B *5/02*
U.S. Cl. 118—630 **7 Claims**



1. In an electrostatic coating system having a conveyor arranged for moving a plurality of workpiece supports along a predetermined path, each of the supports having a first end operatively attached to the conveyor and a second end adapted for supporting a workpiece, an electrostatic charge collector on each of the supports between the first and second ends, means for electrically connecting each of the collectors to its respective workpiece, and means defining an electrostatic charging zone at an inlet of the path, the improvement comprising:

means defining a non-arcing electrical discharge zone at an outlet of the path and so arranged that the electrostatic charge collectors pass through the discharge zone subsequent to passing through the charging zone and having an electrostatic charge imposed thereon, the discharge zone means including an elongate electrical conductor extending along a portion of the path, a resistor, means for connecting one end of the resistor to the conductor and the

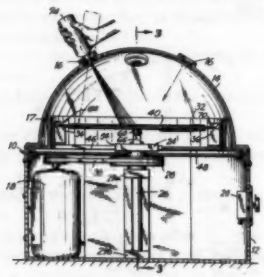
other end to ground, an approach section having an inlet end, and a spaced second end, a portion of said conductor extending between the inlet and second ends in a converging relationship with respect to the predetermined path, the conductor at the inlet end of the approach section being spaced from the path a distance greater than the arcing distance of the electrostatic charge on the charge collector and at the second end being at the path, and a contact section adjoining the converging approach section and extending along the path, positioned so that the electrical charge collectors are in electrical contact therewith substantially along the entire length of the contact section as the collectors pass through the electrical discharge zone, whereby as the supports pass along the path through the approach section the collectors continually converge upon the conductor before contacting the conductor at the contact section of the discharge zone.

4,550,679

DEVICE FOR PRODUCING DECORATIVE PATTERNS ON CLOTHING

William Pipa, New Hyde Park; Robert F. Warren, Brooklyn, and Harvey Russack, Chappaqua, all of N.Y., assignors to Harvey Russack, Chappaqua, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,543
Int. Cl.[4] B05B *13/02*; B05C *11/08*
U.S. Cl. 118—52 **2 Claims**



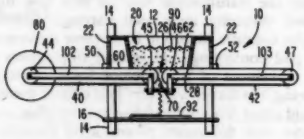
1. A device for producing decorative patterns on clothing comprising a housing, a motor mounted to said housing, stretcher carrier means operatively engaged with said motor, said stretcher carrier means including a first support arm, a second support arm, a first end block mounted proximate to the end of said first support arm, a second end block mounted proximate to the end of said second support arm, means for adjustably supporting said first arm support relative to said second arm support to permit the distance between said first and second end blocks to be varied, a plurality of stretcher means releaseably engaged with said first and second end blocks of said stretcher carrier means, said stretcher means being formed of different sizes to support various sized articles of clothing while the decorative patterns are produced on the clothing, cover means mounted to said housing, said cover means including at least one port, pliable flap means mounted to said port providing a closeable access to the interior of said device to receive the nozzle portion of a container of decorative paint to permit the application of decorative paint to the interior of said device and allow the decorative paint to be applied to the clothing to be decorated from various angles, and activation means electrically engaged with said motor and adapted to cause said stretcher carrier means to rotate within said housing while said paint is applied to said clothing to permit decorative patterns to be created on clothing.

4,550,680

APPARATUS FOR APPLYING A LAYER OF POWDER TO A SURFACE

Max Derendinger, Zurich, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 19, 1984, Ser. No. 672,957
Int. Cl.[4] B05D *7/00*, *5/00*
U.S. Cl. 118—308 **10 Claims**



1. An apparatus for distributing a layer of powder over a surface of a part having a predefined shape comprising:

(a) support means for holding said part so that said surface is facing upwardly;

(b) container means disposed above said surface for holding a quantity of said powder, said container means having an opening facing downwardly and being defined by a peripheral edge having a shape related to said predefined shape of said part; and

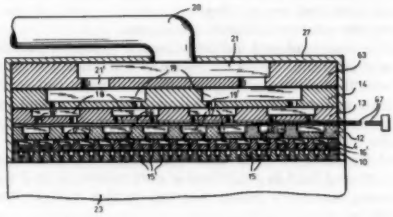
(c) closure means for interacting with said edge of said opening so that said opening is either completely closed or said opening is open only through an aperture that is selectively movable to traverse both said opening and said surface of said part.

4,550,681

APPLICATOR FOR UNIFORMLY DISTRIBUTING A FLOWABLE MATERIAL OVER A RECEIVING SURFACE

Johannes Zimmer, Ebentaler Str. 133, A-9020, and Karl Mayer, Klagenfurt, both of Austria, assignors to Johannes Zimmer

Filed Oct. 7, 1983, Ser. No. 539,913
Claims priority, application Austria, Oct. 7, 1982, 3716/82; Oct. 7, 1982, 3717/82
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—410 **12 Claims**



1. An applicator for uniformly distributing a flowable material over a surface of a relatively moving substrate, comprising a body provided with a channel system having a branched structure extending from an entrance port to a multiplicity of exit ports disposed in a row transverse to the direction of relative motion, the branches of said channel system becoming progressively more numerous and correspondingly narrower from said entrance port to said exit ports, said channel system forming a multiplicity of tiers paralleling said row and communicating with one another through connecting passages, the number of said branches increasing from one tier to the next, said body comprising a housing and a stack of slabs tightly lodged in said housing perpendicular to the direction of relative motion, said slabs having longitudinally extending cavities in the shape of upwardly open recesses with bottoms having

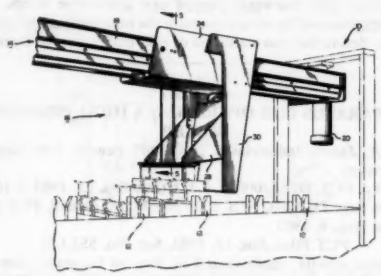
restricted bores, said cavities forming respective tiers of said channel system.

4,550,682

MICRO CRANE FINISHING LINE SYSTEM

Robert J. Juve, Sterling Heights, and Michael J. Eagen, Pleasant Ridge, both of Mich., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Feb. 27, 1984, Ser. No. 584,034
Int. Cl.[4] B05C *3/09*
U.S. Cl. 118—425 **10 Claims**



1. A material finishing line comprising:
a essentially longitudinal series of work stations;
a stationary support beam having a relatively thin vertical dimension said beam extending horizontally above each of said work stations;
stationary drive means supported by said support beam;
transmission means extending along and supported by said support beam and operatively connected to said stationary drive means;
a cart supported by said support beam and operatively connected to said transmission means so that said cart may be selectively propelled along said support beam and having a relatively thin vertical dimension which has minimal extension beyond the vertical extension of said beam;
lift means supported by and substantially contained within said cart;
conductor means for suppling power to said lift means from a stationary source;
a lift arm connected to and supported by said lift means for operative connection to at least one workpiece, said lift arm allowing the workpiece to be raised and lowered, from and to at least one of said work stations; said lift arm being substantially aligned with said cart when said arm is fully raised, so that the vertical extension of said lift arm in a fully raised position substantially overlaps the vertical extension of said cart, thereby minimizing the portion of said lift arm extending vertically beyond the beam and the cart; and
a lift arm guide supported by said cart for restraining movement of said lift arm in a horizontal plane relative to said cart.

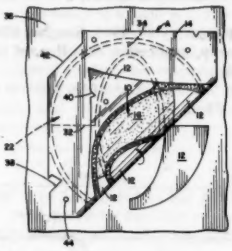
4,550,683

SHEET CONSTRUCTION AND METHOD

Wallace R. Jones, 7621 Eagle Mills Rd., Waite Hill Village, Ohio 44094

Filed Jan. 23, 1984, Ser. No. 573,009
Int. Cl.[4] B05C *21/00*
U.S. Cl. 118—505 **16 Claims**

1. A laminated sheet construction adapted to be secured to a work surface for placing a predetermined design configuration thereon, said sheet construction comprising:
a first layer having a first contact-type adhesive disposed on a first face surface thereof;
a second layer removably affixed to said first layer at said first face surface;
a third layer removably affixed to a second face surface of said first layer opposed to said first face surface by a second adhesive of lower bonding strength than said first adhesive for defining a laminated-type sheet structure; and,
first score lines coextensively penetrating both said second and first layers for defining a predetermined design configuration, preselected areas of said first and second layers



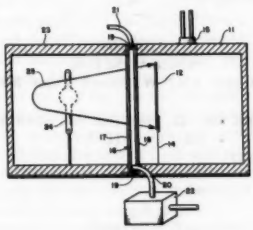
being removable to expose corresponding areas of said second adhesive for allowing said sheet construction to be adhesively secured to a work surface, removal of a selected portion of said second layer incorporating said predetermined design configuration exposing said first adhesive disposed therebeneath for enabling the portion of said first layer associated with said exposed first adhesive to be adhesively secured to a work surface, and removal of said third layer and the remainder of said first and second layers enabling said first layer portion to define the predetermined design configuration on the work surface.

4,550,684

COOLED OPTICAL WINDOW FOR SEMICONDUCTOR WAFER HEATING

Imad Mahawili, Sunnyvale, Calif., assignor to Genus, Inc., Mt. View, Calif.

Filed Aug. 11, 1983, Ser. No. 522,638
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—724 **11 Claims**



1. An apparatus for chemical vapor deposition on a wafer of semiconductor material comprising:
housing means for containing said wafer;
heating means external to said housing means for generating light for directly heating said wafer;
window means interposed between said heating means and said wafer, for transmitting said light into the interior of said housing means and in the direction of said wafer, said window means comprising a first wall and a second wall with a space therebetween for channeling the flow of cooling liquid, with said second wall forming at least a

portion of the innermost surface of said housing means, and said walls arranged such that said light passes through both of said walls and through said cooling liquid before impinging on said wafer; and

fluid control means for actively cooling said second wall by pumping cooling liquid between said walls.

4,550,685

DEVICE FOR SUPPLYING FARM ANIMALS WITH A LIQUID FEED

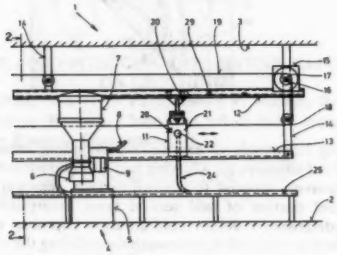
Martin Förster, Gerwigstrasse 27, D 7707 Engen, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 609,095

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 3401168

Int. Cl.⁴ A01K *9/00*

U.S. Cl. 119—71 **8 Claims**



1. A device for supplying farm animals with a liquid feed, comprising, a fixed automatic feeder a flexible feed discharge line connected to said feeder and terminating in an animal operated discharge, a member carrying said animal operated discharge, and conveying means connected to said member for moving said member with said flexible line connected thereto through a plurality of feeding stations, said animal operated discharge member comprises a sucker which is moved with said flexible connecting line through a horizontal path, said sucker comprising a nipple exchangeably inserted in said member, said member comprising a plate, said conveyor means comprising an upper guide rail and a lower guide rail, said plate being displaceable between said upper and lower guide rail, said lower guide rail having a channeled cross section into which said plate extends.

4,550,686

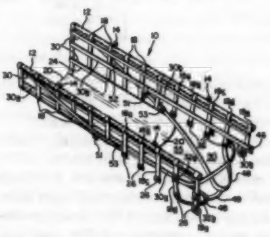
ANIMAL SLING

R. Leonard Munks, 1143 W. March Point Rd., Anacortes, Wash. 98221

Filed Dec. 12, 1983, Ser. No. 560,595

Int. Cl.⁴ A61D *3/00*

U.S. Cl. 119—102 **11 Claims**



1. A sling for supporting a four-legged animal, the sling having a pair of poles with front and rear ends, the sling further having two sides and comprising:

a plurality of longitudinally spaced, transversely extending straps adapted to extend between the poles;

web means extending between forward ones of said transverse straps for supporting the belly of the animal and defining a forward end of an udder/genital opening;

a pair of diagonal straps, one of which extends generally forwardly and upwardly on each side of the sling and which is affixed to a plurality of said transverse straps;

a pair of generally longitudinally extending leg straps mounted between the rearward ends of said diagonal straps and rearward ones of said transverse straps, said longitudinal leg straps crossing the underside of the animal to define the rearward end of said udder/genital opening.

4,550,687

APPARATUS FOR OPERATING A HIGH PRESSURE BOILER

Karl A. Jacob, Industriestr. 2, D-8501 Feucht, Fed. Rep. of Germany

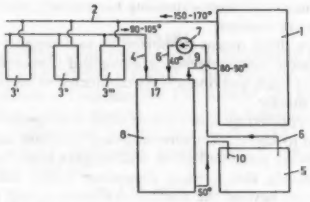
PCT No. PCT/DE83/00006, § 371 Date Sep. 21, 1983, § 102(e) Date Sep. 21, 1983, PCT Pub. No. WO83/02658, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 19, 1983, Ser. No. 552,134

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202144; Apr. 8, 1982, 3213165; Jun. 29, 1982, 3224153; Dec. 31, 1982, 3248785

Int. Cl.⁴ F22B *33/00*

U.S. Cl. 122—1 C **42 Claims**



1. Apparatus for improving the efficiency of a high-pressure steam boiler, especially for dry-cleaning plants, laundries or the like, including consuming units connected to the high-pressure steam boiler, and in which condensate from the consuming units is returned to a feed water reservoir contained in a condensate tank, the feed water being pumped from the condensate tank to the boiler, said apparatus comprising:

a heat exchanger;

means for feeding the condensate to the heat exchanger through a line located up-stream from the condensate tank, the feed water from the condensate tank being pumped into the heat exchanger through a further pipe and being fed from the heat exchanger to the boiler,

said heat exchanger consisting of a second tank with one line disposed therein for one medium and a connection for a second medium, said second tank including a cover in which are disposed connections for a condensate line, a feed water feed line and a feed water discharge line,

said heat exchanger housing therein a feed water coil, said coil extending over the height of the tank and being disposed between the feed water feed line and the feed water discharge line, said feed water line extending to the lowest point of the feed water coil and said feed water discharge line extending from the highest point of the feed water coil,

said condensate line supplying hot condensate opening into the free space of the tank opposite the upper end of the feed water coil, said second tank including an impingement baffle, said baffle defining means for diverting the inflow of hot condensate toward the feed water coil,

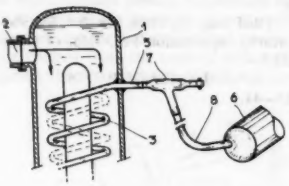
and means for feeding the feed water to be heated into said coil from a cold zone, to a hot zone, of said second tank.

4,550,688

STEAM OUTLET CONNECTION FOR A STEAM GENERATOR

Thierry Zuber, Paris, and René Traiteur, Ris Orangis, both of France, assignors to Novatome, Le Plessis-Robinson and Commissariat a l'Energie Atomique, Paris, both of, France

Filed Jul. 20, 1984, Ser. No. 632,750
Claims priority, application France, Jul. 28, 1983, 83 12476
Int. Cl.[4] F22B *37/22*
U.S. Cl. 122—360 **4 Claims**



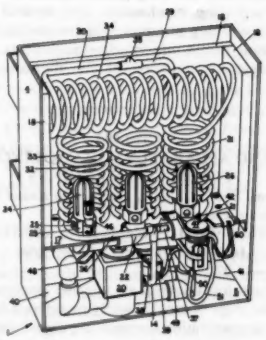
1. A steam outlet connection intended to be disposed between the outlet (5) of a tube (3) of a bank of tubes of a steam generator and a pipe (8) connecting this tube to a steam header, said connection comprising a straight tubular portion (10) welded at one of its ends to said outlet and closed at its other end, and a tubular portion (19) attached as a side branch to said straight portion and at its other end to said connecting pipe (8) leading to said steam header, wherein said closed end of said straight portion (10) has an end wall (14) of a thickness sufficiently slight to permit its easy perforation for the purpose of injecting a gas into the tube through an aperture formed by said perforation of said end wall (14).

4,550,689

GAS INSTANTANEOUS WATER HEATER

Gerry Wolter, 2341 Maryland Ave., Cincinnati, Ohio 45204

Filed Oct. 31, 1983, Ser. No. 546,874
Int. Cl.[4] F22B *37/42*; F22D *5/00*
U.S. Cl. 122—448 R **19 Claims**



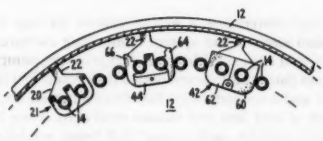
1. An instantaneous gas water heater comprising a casing with a large compartment and a small compartment separated by a dividing wall; a gas inlet coupler attached to the casing through the small compartment and capable of being coupled to a source of gas; an electric gas solenoid valve positioned near the gas inlet coupler, which is normally closed; three gas nozzle jets positioned in the large compartment on the dividing wall and being fluidly connected to said gas inlet coupler in said small compartment; a water coupler connected to said casing through said large compartment and capable of being connected to a source of water; a plurality of coils connected to said water coupler, which surround said gas nozzle jets in said large compartment; a water outlet line which projects through said small compartment and is fluidly connected with said coils in said large compartment; an electronic igniter positioned adjacent one of said gas nozzle jets, which is capable of igniting all the gas nozzle jets; an optical flame sensor positioned in said small compartment which is capable of optically sensing flame in said large compartment; a thermal overriding switch means fastened to said water outlet pipe for sensing outlet water temperature and interrupting the operation of said electric gas solenoid valve is said water is too hot; and an electronic control module for operating said heater, when said water is flowing through said coil and for deactivating said heater when said water or said gas is not flowing through their respective lines.

4,550,690

STEAM TUBE YOKE AND HANGER ASSEMBLY INSULATION COVER

Stuart W. Baugher, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 19, 1984, Ser. No. 672,626
Int. Cl.[4] F22B *37/24*
U.S. Cl. 122—510 **7 Claims**



1. In a steam generator furnace having a generally cylindrical housing forming a conduction heating section, a multiplicity of steam tubes substantially equally spaced apart around the inner circumferential surface of said cylindrical housing and extending axially therethrough, each of said tubes being radially displaced from the surface of said housing by tube hanger means supported by said inner circumferential surface, yoke means overlying said steam tubes and means securing said yoke means to said hanger means with at least one of said steam tubes enclosed for support thereby,

a replaceable refractory cover member enclosing said yoke and at least a portion of said hanger means for installation or removal therefrom without disassembly of said steam tubes from support in said housing by said yoke and hanger means which comprises:

a box member open at the top and one end, the base of said box member including at least one U-shaped opening to frictionally engage one of said tube members to permit said base to abut one side of both said yoke and said portion of said hanger, the sides of said box member extending axially along said tube member and beyond the axial thickness of said yoke and hanger means,

a lid member for enclosing said box member top comprising a pair of nesting elements, each element having a U-shaped opening for slidably engaging a steam tube on the opposite side of said yoke and hanger members, each of said U-shaped openings surrounding diametrically opposed portions of said steam tube and both of said U-shaped openings being at right angles to said box member U-shaped opening,

an end closure member nestable between said open end and said base of said box member to overlie said one side of said yoke and hanger means, said closure member having a U-shaped opening therein slidably engagable with said U-shaped opening in said box member to surround the diametrically opposed portion of said steam tube to com-

plete the enclosure of said tube yoke and at least a portion of said hanger and the portion of said steam tube extending therethrough, and

means for securing one of said pair of lid elements to said box member to clamp said end closure and the other of said pair of lid elements therebetween.

4,550,691

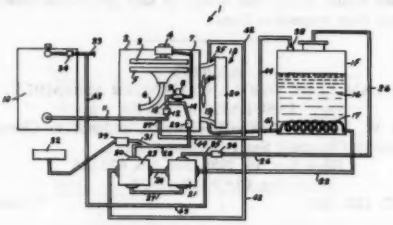
FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Duncan R. McWade, Lot 4, Kiandra Crescent, Yerrinbool, N.S.W. 2575, Australia

Filed Jan. 16, 1985, Ser. No. 691,876

Int. Cl.⁴ F02B *75/12, 43/08*

U.S. Cl. 123—3 **16 Claims**



1. A fuel system for a motor vehicle having an internal combustion engine, said system comprising carburetor means to supply said engine with an air-fuel mixture; pump means to supply said carburetor means with a first liquid fuel from a first reservoir and a second vapor fuel from a heated second reservoir, each of said first and second reservoirs being located on said motor vehicles, said second fuel being produced by fermentation within said second reservoir, means for withdrawing vapor given off by said first liquid fuel in said first reservoir and means for mixing air and said vapor given off by said first liquid fuel with said second vapor fuel being supplied to said carburetor means by said pump means.

4,550,692

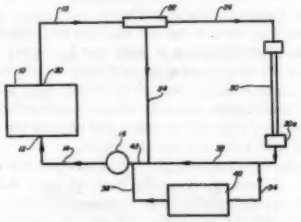
COOLING SYSTEM

John G. Crofts, Sr., Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 13, 1984, Ser. No. 579,396

Int. Cl.⁴ F02B *29/04;* **F01P** *3/12*

U.S. Cl. 123—41.1 **7 Claims**



1. A cooling system for an internal combustion engine comprising an engine having a liquid coolant inlet and a liquid coolant outlet; a liquid coolant pump having an outlet connected to the engine inlet; a thermostatically controlled valve having an inlet connected to the engine outlet and first and second outlets, the setting of said valve being dependent upon the temperature of the coolant leaving said engine outlet; a radiator having an inlet connected to the valve first outlet and an outlet connected by a first flow line to an inlet of said pump; a by-pass flow line interconnecting the valve second outlet with the said first flow line at a first location upstream of said pump inlet; an aftercooler having an inlet connected to the said first flow line at a second location upstream of said first location and an outlet connected to the said first flow line at a third location downstream of said first location and upstream of said pump inlet; and flow-control means disposed within the said first flow line intermediate said first and third locations.

4,550,693

TEMPERATURE CONTROL ARRANGEMENT FOR COMBUSTION ENGINE

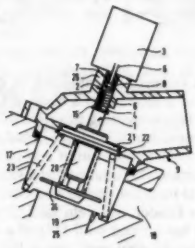
Roland Saur, Stuttgart, Fed. Rep. of Germany, assignor to Behr-Thomson Dehnstoffregler GmbH, Kornwestheim, Fed. Rep. of Germany

Filed Aug. 15, 1984, Ser. No. 640,964

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332587

Int. Cl.⁴ F01P *7/16*

U.S. Cl. 123—41.1 **14 Claims**



1. An arrangement for controlling the temperature in a coolant circulating system of an internal-combustion engine of a motor vehicle, which includes a thermostatic valve means for controlling the coolant flow from said internal-combustion engine through a direct return flow line and through a heat exchanger back to said internal-combustion engine, a thermostatic working element having a housing supporting a valve disk for controlling coolant flow leading to said heat exchanger, and a working piston extending under heat relative to said thermostatic working element and being, supported at a counterbearing, said working piston and said counterbearing forming an adjusting mechanism, and control means, connected to said working piston or said counterbearing, for forcing said working piston into an adjusted position selectively to delay or accelerate actuation of the thermostatic working element.

4,550,694

PROCESS AND APPARATUS FOR COOLING INTERNAL COMBUSTION ENGINES

John W. Evans, Sharon, Conn., assignor to Evans Cooling Associates, Sharon, Conn.

Filed May 11, 1984, Ser. No. 609,575

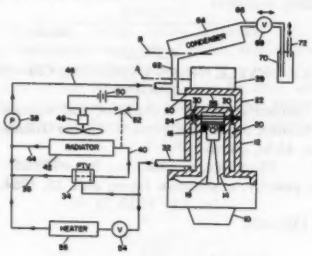
Int. Cl.⁴ F01P *3/22;* **C09K** *5/04*

U.S. Cl. 123—41.02 **21 Claims**

1. A process for cooling an internal combustion engine comprising the steps of mechanically pumping a boilable liquid coolant having a saturation temperature above about 132° C. at atmospheric pressure from the engine coolant jacket through a heat exchanger and back to the coolant jacket to provide heat rejection in the heat exchanger such that no vapor is formed in the liquid outside the coolant jacket as a result of the pressure drop induced by the pump and such that the temperature of the coolant within portions of the head portion of the coolant jacket that are in elevation above locations adjacent to combustion chamber domes and exhaust runners is maintained below the saturation temperature of the coolant at the system

pressure, continuously removing from the engine coolant jacket by substantially unrestricted convection through at least one outlet leading from the highest region in the head portion of the coolant jacket substantially all gases other than gases that condense within the coolant in the jacket, including vapor formed by localized boiling of the liquid coolant in areas adjacent to combustion chamber domes and exhaust runners, whereby the major part of the head portion of the engine coolant jacket is kept filled with coolant in the liquid state at all times, conducting gases from the outlet to a condenser means that includes a condenser chamber, and returning the condensate from the condenser means to the coolant jacket.

11. Apparatus for cooling an internal combustion engine comprising a coolant jacket around at least part of each combustion chamber and exhaust runner of the engine and containing a boilable liquid coolant having a saturation temperature above 132° C. at atmospheric pressure, a liquid cooling circuit including a heat exchanger and mechanical pump means for circulating the coolant from the coolant jacket through the heat exchanger and back to the coolant jacket to provide heat



rejection in the heat exchanger such that no vapor is formed in the liquid cooling circuit as a result of the pressure drop induced by the pump and such that the temperature of the coolant within portions of the head portion of the coolant jacket that are in elevation above locations adjacent to combustion chamber domes and exhaust runners are maintained below the saturation temperature of the coolant for the system pressure, at least one outlet from the highest region in the coolant jacket adapted to remove and release continuously by substantially unrestricted convection from the coolant jacket substantially all gases, including vapor formed by localized boiling of the liquid coolant in areas adjacent to combustion chamber domes and exhaust runners, other than gases that condense in the coolant within the jacket, whereby the major part of the coolant jacket in areas around combustion chamber domes and exhaust runners is kept filled with coolant in the liquid phase at all times, condenser means including a condenser chamber for receiving the gases removed and released from the coolant jacket through the outlet and condensing condensable constituents thereof, and return means for returning the condensate from the condenser means to the coolant jacket.

4,550,695

FAN DEVICE FOR INTERNAL COMBUSTION ENGINE

Yasuyuki Kikuchi; Eiichi Matsumoto, both of Yokohama, and Yoshimasa Tanaka, Ayase, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 27, 1984, Ser. No. 605,675

Claims priority, application Japan, Jun. 8, 1983, 58-102108; Jun. 8, 1983, 58-102109

Int. Cl.⁴ F01P *5/02*

U.S. Cl. 123—41.12 **12 Claims**

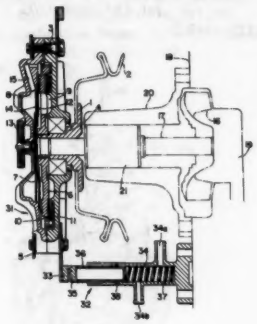
1. A fan device for an internal combustion engine, comprising:

a driving member;

a fan;

means for providing a fluid coupling between said driving member and said fan; and

brake means for preventing rotation of said fan at a predetermined temperature indicative of engine temperature, said



brake means including a temperature responsive portion variable in shape in response to changes in engine temperature, said portion having a first shape preventing fan rotation at said predetermined temperature.

4,550,696

INTERNAL COMBUSTION ENGINE WITH DISC INLET VALVE

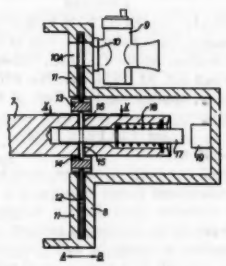
Josef Ehrlich, Berkhamsted, England, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 20, 1984, Ser. No. 642,177

Claims priority, application United Kingdom, Aug. 26, 1983, 8323081

Int. Cl.⁴ F01L *7/06*

U.S. Cl. 123—73 D **4 Claims**



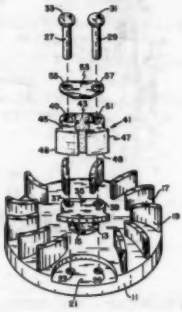
1. An internal combustion engine having a rotary disc inlet valve, means for varying timing of opening and closing of said inlet valve to a fully retarded condition in response to an increase in engine speed, and latch means for holding said inlet valve in the fully retarded condition and including a magnet which latches a part of the means for varying the timing of said inlet valve in a position corresponding to the fully retarded condition of said inlet valve.

4,550,697

FLYWHEEL MOUNTING OF PERMANENT MAGNET GROUP

Kenneth W. Campen, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 20, 1983, Ser. No. 563,690
Int. Cl.[4] F02P 1/00
U.S. Cl. 123—149 D 12 Claims



1. A flywheel assembly for a small internal combustion engine of the type supporting a permanent magnet structure near the flywheel outer periphery for cooperating with a fixed ignition assembly for inducing spark creating voltages in the ignition assembly as the magnet structure rotates past the ignition assembly and comprising:

a ferromagnetic flywheel;

a permanent magnet structure having a permanent magnet and a pair of flux transmitting pole shoes adjacent the respective poles of the permanent magnet, the poles of said magnet and the pole shoes circumferentially arranged near the periphery of said flywheel;

a substantially non-magnetic spacer axially positioned intermediate the flywheel and the permanent magnet structure for reducing flux leakage between the pole shoes by way of the flywheel; and

a solid generally cylindrical fastener of substantially non-magnetic material passing through apertures in the magnet structure, spacer and flywheel, said fastener expanded radially in said apertures to tightly engage the magnet structure, spacer and flywheel and fix the relative positions thereof.

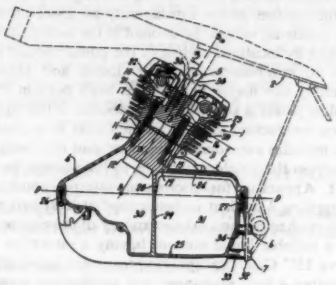
4,550,698

INTERNAL COMBUSTION ENGINE MOUNT

Reinhard Könneker, Monsheim, Fed. Rep. of Germany, assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Jul. 13, 1984, Ser. No. 630,699
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326321
Int. Cl.[4] F02F 7/00
U.S. Cl. 123—195 AC 9 Claims

1. An internal combustion engine, which together with a motorcycle underframe forms a supporting unit, said engine comprising a cylinder head having axially extending wall portions and a crankcase housing, a support core comprising a first body extending between the wall portions of said cylinder head and being integral with and disposed within said cylinder head, holding members for securing the internal combustion engine to the motorcycle underframe, one of said holding members being coupled to the cylinder head and another to the crankcase housing of said engine, said holding member attached to the cylinder head being disposed in a median plane of the cylinder head and joined to the support core provided inside the cylinder head, an attachment tie comprising a second body disposed within and integral with the crankcase housing, said second body being in abutment with and forming a continuation of the first body forming said support core, said support core and said attachment tie being connected to one another by



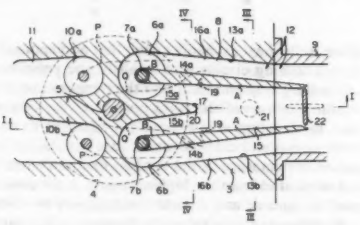
bolts to provide a continuous body extending between said cylinder head and said crankcase for supporting said one of said holding members.

4,550,699

INTAKE DEVICE OF AN INTERNAL COMBUSTION ENGINE

Takeshi Okumura; Tomio Warashina, and Kiyoshi Nakanishi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 6, 1984, Ser. No. 679,066
Claims priority, application Japan, Jan. 13, 1984, 59-3551
Int. Cl.[4] F02B 31/00
U.S. Cl. 123—308 16 Claims



1. An internal combustion engine having cylinders each having a first intake valve, a second intake valve, an intake passage common to said first and second intake valves, a first valve stem guide projecting into the intake passage and supporting the first intake valve, and a second valve stem guide projecting into the intake passage and supporting the second intake valve, the intake passage having a first side wall which extends from an outer periphery of the first intake valve towards the upstream of the intake passage and having a second side wall which extends from an outer periphery of the second intake valve toward the upstream of the intake passage, said engine comprising:

a first side separating wall extending in said intake passage from said first valve stem guide toward the upstream of said intake passage;

a second side separating wall extending in said intake passage from said second valve stem guide toward the upstream of said intake passage, said first side separating wall and said second side separating wall defining a first side passage between said first side separating wall and said first side wall of said intake passage, a second side passage between said second side separating wall and said second side wall of said intake passage, and a central passage between said first side separating wall and said second side sepa-rating wall;

a central separating wall extending between said first intake valve and said second intake valve and between said first side separating wall and said second side separating wall at a downstream end portion of said central passage, said central separating wall defining a first branch passage between said central separating wall and said first side separating wall and defining a second branch passage between said central separating wall and said second side separating wall, said first side separating wall having a first opening which interconnects said first side passage to said first branch passage, said second side separating wall having a second opening which interconnects said second side passage to said second branch passage;

a fuel injector arranged in said central passage upstream of said central separating wall; and,

a control valve arranged in said central passage upstream of said fuel injector and opening when the engine is operating in a predetermined operating state.

4,550,700

INTAKE SYSTEM FOR MULTI-INTAKE VALVE TYPE ENGINE

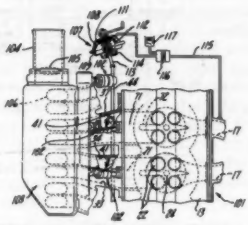
Takumori Yoshida, Iwata; Akira Yamada, Shizuoka, and Sadayuki Shinmura, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Continuation of Ser. No. 332,825, Dec. 21, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 597,815

Claims priority, application Japan, Dec. 22, 1980, 55-182223

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—432 **24 Claims**



1. In an induction system for an internal combustion engine of the type having a pair of intake ports for providing an air charge to a common chamber of the engine, first and second intake passages each independently serving a respective one of said intake ports, throttle valve means for controlling the flow through said induction system, the improvement comprising an interconnecting passage extending transversely between said first intake passage and the second intake passage downstream of said throttle valve means and upstream of said intake ports and a fuel injection nozzle discharging against a transverse wall that defines a portion of said interconnecting passage in a downstream direction relative to the interconnected portion of said first and second intake passages.

11. In an induction system for an internal combustion engine of the type having a pair of intake ports for providing a charge to a common chamber of the engine, separate intake passages each independently serving a respective one of said intake ports, throttle valve means for controlling the flow through said intake passage so that an idle charge is delivered to said chamber through a first of said intake passages and wide open load charge requirements are supplied through both of said induction passages, the improvement comprising an interconnecting passage extending between said first intake passage and the second intake passage in proximity to said intake ports downstream of said throttle valve means and upstream of said intake ports for communicating said intake passages with each other regardless of the position of said throttle valve means for flow to said chamber through each of said intake ports regardless of the position of said throttle valve means.

4,550,701

AIR-FUEL RATIO CONTROL IN AN INTERNAL COMBUSTION ENGINE

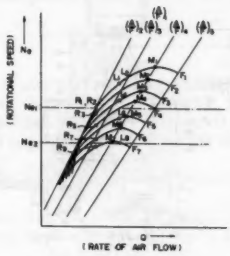
Atsushi Suzuki; Masakazu Ninomiya, both of Kariya; Katsuya Maeda, Obu, and Yutaka Kawashima, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 5, 1984, Ser. No. 597,098

Claims priority, application Japan, Apr. 8, 1983, 58-62669

Int. Cl.[4] F02D *37/02*

U.S. Cl. 123—436 **8 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine for a vehicle operable in either of an automatic constant speed control state and a non-automatic speed control state in which speed of said vehicle is controlled, respectively, to be constant or varied as commanded by an operator of said vehicle, said method comprising the steps of:

changing the amount of air supplied through a by-pass air supply path which by-passes the main air supply path to realize at least two different values of the air-fuel ratio in the vicinity of a base air-fuel ratio;

running the engine with said realized different values of the air-fuel ratio;

detecting at plural operation points the signals of parameters of the engine running state, including at least one of engine rotational speed and engine torque, under the running of the engine with said realized different values of the air-fuel ratio;

deciding whether the base air-fuel ratio is in the rich or in the lean side of the air-fuel ratio for optimum specific fuel consumption by comparing said signals detected at said plural operation points; and

correcting the air-fuel ratio on the basis of the result of said decision;

a different number of operation points for detecting said signals of said parameters of the engine running state being selected for said automatic constant speed control state and for said non-automatic speed control state.

4,550,702

SPILL CONTROL SYSTEM FOR DISTRIBUTOR PUMP

Ilija Djordjevic, Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Oct. 5, 1984, Ser. No. 658,288

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—450 **28 Claims**

1. A fuel injection pump adapted to deliver discrete charges of pressurized fuel to the cylinders of an associated internal combustion engine comprising:

a housing;

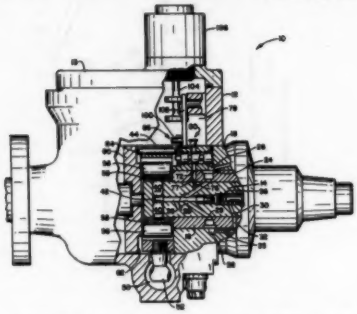
a rotor rotatably mounted within said housing and including a pump chamber for receiving charges of fuel, a set of reciprocable plungers mounted in said chamber for pressurizing the fuel charges, a fuel distributor passage communicating with said pump chamber for delivering charges of pressurized fuel to the associated engine, and a spill passage communicating with said pump chamber;

a cam ring operatively engageable with said plungers for

reciprocating said plungers upon rotation of said rotor to pressurize fuel charges received in said pump chamber, said cam ring being angularly adjustable relative to said housing to control the timing of reciprocation of said plungers;

spill passage means communicating with said spill passage to divert pressurized fuel into the interior of said housing;

spill valve means to variably control the passage of fuel from said spill passage means into said housing interior, said



spill valve means including a valve member which is axially positionable for selectively closing the spill passage means to the passage of fuel therethrough and angularly adjustable to variably control the quantity of fuel diverted into the housing interior; and

valve actuator means actuable to control the axial position of said valve member, said valve actuator means being angularly adjustable with said cam ring for regulating the timing of the actuator means in accordance with the reciprocation of the plungers;

4,550,703

CONTINOUS METHOD OF FUEL INJECTION IN ELECTRONICALLY CONTROLLED ENGINE

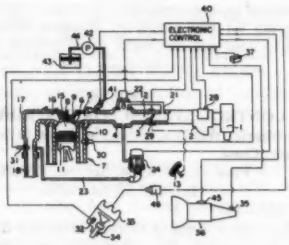
Takayuki Ootuka, and Toshiyuki Murai, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 11, 1982, Ser. No. 357,148

Claims priority, application Japan, Sep. 28, 1981, 56-152045

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—478 **10 Claims**



1. A method for fuel injection in a vehicle with an electronically controlled engine having a calculated fuel injection amount and a minimum fuel injection amount, the minimum fuel injection amount, in the absence of fuel cut-off, being supplied to the engine when the calculated fuel injection amount is less than the minimum fuel injection amount, said method comprising the steps of:

setting the minimum fuel injection amount to a first predetermined value; and

setting the minimum fuel injection amount to a second predetermined value higher than said first predetermined value whenever driveability of the vehicle is adversely affected by the setting of the minimum fuel injection amount to said first predetermined value.

4,550,704

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE HAVING DISCONNECTABLE GROUPS OF CYLINDERS

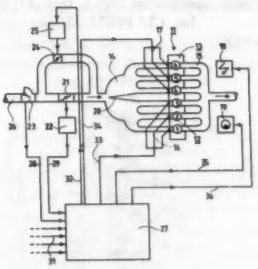
Hans Barho, and Helmut Denz, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,879

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313038

Int. Cl.⁴ F02D *17/02*

U.S. Cl. 123—481 **21 Claims**

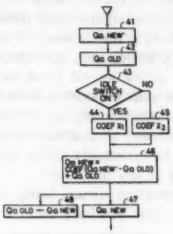


1. A multi-cylinder internal combustion engine, particularly for use in motor vehicles, having its cylinders divided into a plurality of groups each including at least one cylinder, at least one of said groups being disconnectable in dependence on the occurrence of at least one operational parameter of the engine, comprising an electrically controlled disconnecting means for disconnecting said one group, monitoring means for monitoring the operational parameters of the engine, control means controlled by said monitoring means to activate said disconnecting device when a predetermined value of the operational parameter is detected, said monitoring means including a device for measuring the engine load and a device for measuring the rotary speed of the engine, said control means including an ignition angle adjusting device and a fuel metering device, means for generating a threshold value depending on the measured engine load and the rotary speed, said threshold value generating means being coupled to said disconnecting means so as to inactivate the same when the threshold value is exceeded, a second means for generating a second threshold depending on the engine load and the rotary speed of the engine, the second threshold being larger than the first-mentioned threshold and being coupled to said disconnecting means so as to disconnect at least one of the cylinder groups in dependence on the second threshold value, and further comprising means for enriching the fuel mixture by a correction factor and means for exchanging the ignition angle prior to the changeover of the cylinder groups so that within a predetermined time interval a maximum torque of the engine is generated.

4,550,705
ELECTRICAL FUEL INJECTOR

Masami Nagano; Takeshi Atago, and Tatsuya Yoshida, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,432
Claims priority, application Japan, Mar. 3, 1982, 57-32362
Int. Cl.[4] F02D 5/00
U.S. Cl. 123—488 7 Claims



1. In an electrical fuel injector comprising:

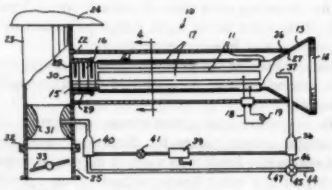
an injection valve for injecting fuel into an internal combustion engine; an air flow meter for detecting an amount of intake air fed to said internal combustion engine through a throttle valve; a revolution counter for measuring the rate of rotations of said internal combustion engine; and an electronic circuit for determining an opening and closing time of said injection valve based on output signals from both said air flow meter and said revolution counter,

the improvement in that there is provided a first digital filter which filters an input signal with a first coefficient when an opening degree of said throttle valve is smaller than a predetermined value and filters the input signal with a second coefficient larger than said first coefficient when the opening degree of said throttle valve is larger than the predetermined value, and the output signal from said air flow meter is applied to said electronic circuit as the input signal through said first digital filter, whereby said digital filter has a larger effect with said first coefficient than with said second coefficient.

4,550,706
FUEL VAPORIZER

Paul H. Hoffman, Hialeah, Fla., assignor to Hoffman-Lewis, Ltd., Coral Gables, Fla.

Continuation of Ser. No. 534,410, Sep. 21, 1983, abandoned. This application Dec. 19, 1984, Ser. No. 683,468
Int. Cl.[4] F02M 31/00
U.S. Cl. 123—549 11 Claims



1. A fuel vaporizer for an internal combustion engine, comprising:

carburetor means for regulating the supply of air and fuel mixture to the engine, said carburetor means including a tubular housing for flow of a primary air stream to the engine;

fuel atomizing means for atomizing liquid fuel supplied thereto;

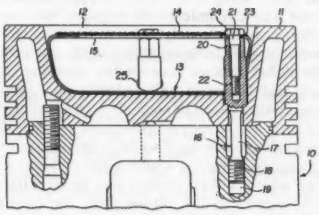
fuel vaporizing means connected between the fuel atomizing means and the carburetor means to vaporize the atomized fuel and to supply air and vaporized fuel to the primary air stream, said fuel vaporizer means comprising a vaporizer chamber having an inlet end for receiving air and atomized fuel and an outlet end for delivery of air and vaporized fuel to the carburetor means, and heating means operatively associated with the vaporizer chamber to heat the air and atomized fuel flowing therethrough to dry and vaporize the atomized fuel; and

supplemental vaporized fuel supply means connected with the carburetor means to supply vaporized fuel directly to the carburetor means during start up and acceleration of the engine.

4,550,707
METHOD FOR IMPROVING THE PERFORMANCE OF AN INTERNAL COMBUSTION ENGINE, DEVICE FOR IMPLEMENTING THE METHOD, AND INTERNAL COMBUSTION ENGINE EQUIPPED WITH SAID DEVICE

Alain Kervagoret, 12 bis, rue de Modenheim, 68390 Sausheim, France

Filed Aug. 17, 1984, Ser. No. 641,980
Claims priority, application France, Sep. 7, 1983, 83 14352
Int. Cl.[4] F02F 3/02
U.S. Cl. 123—669 13 Claims



1. Method for improving the performance of an internal combustion engine of relatively low compression ratio and having at least one piston, the head of which defines a cavity, wherein within the cavity of the head (11) of the piston there is provided a device (13, 14) for storing heat energy during the combustion phase and for releasing the stored heat into the intake air during the intake and compression phase, wherein said device includes a bulbous casing, and said device (13) is attached within the cavity (12) of the head (11) of the piston (10), with a space between the concave interior walls of the cavity (12) of the piston head and the convex exterior walls of the casing (13) for permitting the free expansion of the heat storing device and decreasing the heat exchange with the piston, wherein said device has mesh conductive to thermal energy exchange attached above said casing over an upwardly facing opening thereat, said mesh creating a turbulence downstream and providing an increased heat exchange surface.

4,550,708
ABRASIVE CUTTING WHEEL FOR CUTTING ROCK-LIKE MATERIAL

Carl F. Roemmele, Leawood, Kans., and Joseph D. Ekland, Birmingham, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Jul. 6, 1983, Ser. No. 510,439
Int. Cl.[4] B28D 1/04
U.S. Cl. 125—15 23 Claims

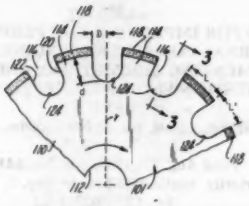
1. A rotatable cutting wheel for wet cutting of rock or rock-like material, said cutting wheel comprising:

a circular generally disc-shaped drive core having a plurality of circumferentially extending and circumferentially-spaced support surfaces, each of said support surfaces

having affixed thereto for substantially the full circumferential length thereof an abrasive cutting material means capable of cutting an abradable rock or rock-like material;

said core having a plurality of generally U-shaped gullets, each said U-shaped gullet therein being defined by the space between each adjacent pair of said support surfaces, said U-shaped gullet extending between a closed gullet end located a substantial radial distance inwardly of said support surfaces and an open gullet end being in communication with the space between said adjacent pair of said support surfaces, the circumferential width of said open gullet and being generally coextensive with the circumferential length of said space;

the ratio of said circumferential length of each said adjacent



pair of said support surfaces to the circumferential length of said space being in the range of approximately 0.75 to 1.20, the total circumferential length of said support surfaces being approximately equal to the total circumferential width of said U-shaped gullets at the open end thereof, and the radial distance between the open and closed ends of each said U-shaped gullet closely approximating the circumferential width of each said open gullet end;

whereby each said U-shaped gullet and its respective space between adjacent support surfaces cooperate to define a fluid passageway having a substantial volumetric capacity through which a fluid coolant can be circulated in substantial amounts to the cutting area, can cool the drive core in the area immediately adjacent the abrasive cutting material means, and can carry away swarf therefrom.

4,550,709

CONSTRUCTION FOR PREVENTING OIL LEAKAGE IN OIL BURNER

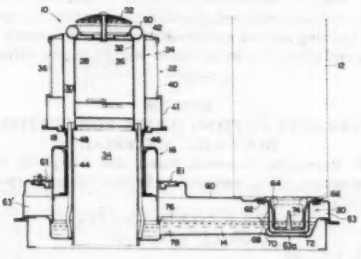
Kazuharu Nakamura; Yoshimasa Tsuboi, and Akinobu Kondo, all of Nagoya, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Jul. 23, 1984, Ser. No. 633,322

Claims priority, application Japan, Jul. 21, 1983, 58-113466[U]

Int. Cl.⁴ F24C *5/04*

U.S. Cl. 126—96 **6 Claims**



1. A construction for preventing oil leakage in an oil burner of the type that a cartridge-type oil tank having a valve-operated cap is invertedly supported on an auxiliary tank provided in said oil burner through an oil tank supporting means provided at the upper wall of said auxiliary tank and fuel oil is fed from said oil tank through said auxiliary tank to a combustion mechanism of said oil burner, comprising:

an oil reservoir mounted through said oil tank supporting means of said auxiliary tank to said auxiliary tank to surround said valve-operated cap of said oil tank; said oil reservoir being formed at the side portion thereof facing said combustion mechanism of said oil burner with a through-hole;

said auxiliary tank having a volume determined to allow an oil level in said auxiliary tank obtained when said oil burner falls down in the forward or rearward direction to be substantially lower than said through-hole of said oil reservoir and allow an oil level in said auxiliary tank obtained when said oil burner falls down in the lateral direction to be substantially lower than said through-hole of said oil reservoir, so that said through-hole of said oil reservoir may be constantly above the oil level when said oil burner falls in any direction;

said oil tank supporting means being oil-sealedly mounted with respect to said auxiliary tank.

4,550,710

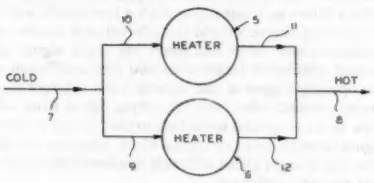
MODULAR WATER HEATER CONNECTION APPARATUS AND METHOD FOR FABRICATING SAME

William E. McDonald, II, 1560 Cloverdale, Highland Park, Ill. 60035

Filed Sep. 13, 1982, Ser. No. 416,951

Int. Cl.⁴ F24H *1/00*

U.S. Cl. 126—362 **6 Claims**



1. A modular water heater connection apparatus for integrally joining the cold water input and hot water output bungs respectively of a plurality of conventional water heaters arranged in tandem, said apparatus comprising:

low-profile cold water connection means including single cold water circuit input means for directing substantially cold water from a single input source to said apparatus and a plurality of cold water heater input means operably connected at their first ends to said cold water circuit input means for diverting cold water from said circuit input means to each of the cold water input bungs possessed by each of said tandem water heaters respectively;

each of said cold water heater input means operably connected at their second ends to each of said respective cold water input bungs;

low-profile hot water connection means including a single hot water circuit output means for directing water heated by each of said water heaters to a single output destination and a plurality of hot water heater output means operably connected at their first ends to said hot water circuit output means and at their second ends to each of said respective hot water output bungs to transfer said heated water from each of said water heaters to said single output destination;

one or more of said cold water connection means and hot water connection means including flow stoppage means for closing off the flow of water therethrough for purposes of servicing one or more of said plurality of heaters;

said low-profile cold and hot water connection means being connected to said respective bungs by bung connection

means, and to said respective circuit input and output means by circuit attachment means;

said apparatus further including hot water segregation means for isolating the entire position of said hot water connection means to preclude inadvertent contact therewith;

water flow balancing means for equalizing the flow of cold water into and hot water out of each of said tandem water heaters;

said water flow balancing means including said cold water circuit input means being equidistantly positioned between each of said plurality of cold water heater input means; and said hot water circuit output means being equidistantly positioned between each of said plurality of hot water heater output means; and

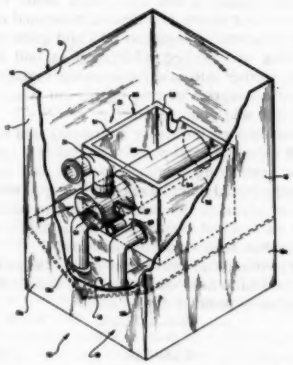
said equidistant positioning of said cold and hot water circuit input and output means serving to equalize and balance flow through each of said heater input and output means respectively.

4,550,711

PULSE COMBUSTION DEEP FAT FRYER

James C. Griffiths, Cleveland, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Dec. 9, 1983, Ser. No. 559,943
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—391 **8 Claims**



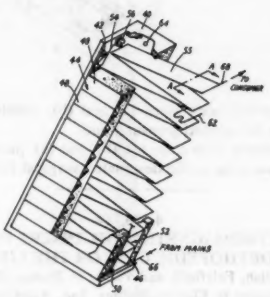
1. A deep fat fryer comprising an open top vessel for containing a quantity of cooking oil and a heater unit disposed within the vessel and adapted to be substantially immersed in the oil, said heater unit including a pulse combustion burner and a heat exchanger arranged to receive combustion products from the burner and deliver such products to an exhaust, the heat exchanger including a plurality of pairs of substantially flat plates extending substantially vertically in the vessel and forming relatively narrow passages having a height substantially greater than their narrow width dimension, said narrow passages being adapted to receive the combustion products of the burner, said pairs of plates being adapted to be in thermal contact with the surrounding oil and providing heat exchange between the combustion products and the oil, said plates being adapted to induce relatively strong convection currents in the oil to improve the efficiency of the heater unit.

4,550,712

SOLAR WATER HEATING APPARATUS AND SOLAR CONCENTRATOR USEFUL THEREWITH

Zvi Moravnik, Hadera, Israel, assignor to Solar Power Laboratories, Ltd., Hadera, Israel

Continuation-in-part of Ser. No. 395,981, Jul. 7, 1982, Pat. No. 4,471,763. This application Jun. 28, 1983, Ser. No. 508,535
Claims priority, application Israel, Jun. 29, 1982, 66166
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—439 **10 Claims**



1. Solar water heating apparatus comprising:

a housing;

means disposed in the housing for receiving incident solar energy and for heating a first fluid thereby and comprising a non-focusing solar energy concentrator comprising:

a solar energy absorbing plate defining first and second parallel back-to-back solar energy absorbing surfaces;

solar energy transmissive material disposed adjacent said first and second parallel absorbing surfaces, said solar energy transmissive material defining first and second incident surfaces and also defining first and second reflecting surfaces operative to reflect radiation incident at said first and second incident surfaces and having an index of refraction and a configuration selected to provide total internal reflection at said first and second incident surfaces of radiation incident on said incident surfaces within a predetermined angular range of incident radiation relative to said first and second absorbing surfaces;

heat exchanger means disposed in said housing for contacting said heated first fluid and being operative to heat a second fluid; and

means for providing circulation of said first fluid through said receiving and heating means and in thermal contact with said heat exchanger means, and

wherein said first fluid is maintained at atmospheric pressure.

4,550,713

METHOD AND APPARATUS FOR OPPOSING DEFORMITY, DISPLACEMENT, AND EXPULSION OF THE OCULAR TISSUES DURING OPEN EYE SURGERY

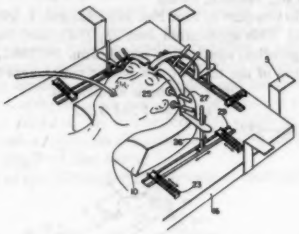
Frederic E. Hyman, 40 E. 9th St., New York, N.Y. 10003

Filed Mar. 10, 1983, Ser. No. 474,812
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—1 R **54 Claims**

1. A method for opposing deformity, displacement, and expulsion of ocular tissues during eye surgery of the types in which a cut is present through the ocular wall comprising the steps of:

(a) generating an air pressure higher than ambient atmospheric pressure in a space outside the eye that bears upon a designated surgical field;

(b) concurrent with step (a), maintaining those surfaces of the eye that lie outside the border of said designated surgical field at ambient atmospheric pressure;



(c) concurrent with steps (a) and (b), stabilizing the eye against the applied pressure; and

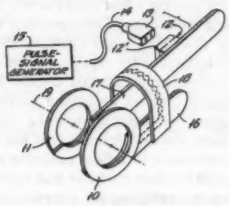
(d) concurrent with steps (a), (b), and (c), providing access of the surgeon to the designated surgical field.

4,550,714

ELECTROMAGNETIC COIL INSERT FOR AN ORTHOPEDIC CAST OR THE LIKE

Roger J. Talish, Fairfield, and Victor F. Banko, Dover, both of N.J., assignors to Electro-Biology, Inc., Fairfield, N.J.

Filed Mar. 9, 1983, Ser. No. 473,801
Int. Cl.[4] A61N *1/40*
U.S. Cl. 128—1.5 **19 Claims**



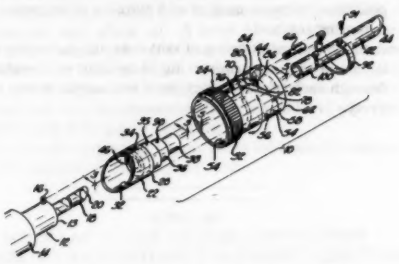
1. An electromagnetic bodytreatment device for surgically non-invasive modification of the growth, repair and maintenance behavior of living tissues and cells by a specific and selective change in electrical environment, comprising, as an article of manufacture, an insert for an orthopedic cast or the like to enclose an afflicted body-member region and an adjacent unafflicted body-member region, said insert comprising a stiffly flexible elongate strip of magnetically transparent material, a single multiturn electrical coil of initially generally flat annular configuration and fixed to one side of said strip, with said strip extending in at least one generally radially outward direction from said coil and to a longitudinally offset location removed from said coil, said strip being elongate to the extent of at least the coil diameter and thus sufficiently elongate to enable a stabilizing wrapped application thereof to the unafflicted body-member region while positioning the axis of the coil for intersection with the afflicted region, said coil having leads mounted to said strip and extending to said offset location, the annular configuration of said coil establishing a circular central region within which magnetic flux may be concentrated upon application of an electrical signal via said leads, and means including an externally accessible cable connector carried by said strip at said location and connected to said leads for electrically exciting said coil with a therapeutically beneficial electrical signal, whereby in the course of conventionally applying a cast for orthopedic support of an afflicted limb or other body region, said insert may be embedded in the cast in longitudinal overlap of said coil and strip to leave externally exposed essentially only said cable connector.

4,550,715

ENDOSCOPE INSERTION CANNULA ASSEMBLY

John A. Santangelo, East Freetown, and Michael DiGiantommaso, Brockton, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Oct. 24, 1983, Ser. No. 544,680
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—4 **17 Claims**



1. A cannula assembly for inserting an endoscopy instrument through an opening into the body in a known orientation and for locking the instrument in that known orientation during use comprising:

means affixed to an endoscopy instrument for controlling rotational orientation of said endoscopy instrument;

guide means for receiving an endoscopy instrument and for operatively engaging said controlling means for placing said controlling means in a desired rotational orientation as said instrument is advanced into said guide means and for holding said desired orientation as said instrument advances further into said guide means regardless of the rotational orientation of said instrument when it is first inserted into said guide means;

spring biased locking means for restraining said controlling means in a desired axial position including a cam surface biased in interfering relationship with said controlling means and adapted to move out of the way as said controlling means advances into said guide means and to return towards its original biased position as said controlling means reaches its desired axial position;

to thereby position said instrument in its desired rotational orientation and to hold said instrument in its desired rotational and axial position during use.

4,550,716

LIQUID SUPPLYING DEVICE FOR ENDOSCOPE

Kunio Kinoshita, Tokyo, Japan, assignor to Olympus Optical Company, Tokyo, Japan

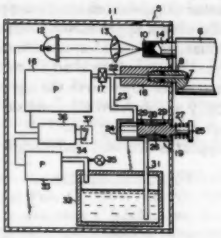
Filed Apr. 25, 1984, Ser. No. 603,695
Claims priority, application Japan, Apr. 30, 1983, 58-77327
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **12 Claims**

1. A liquid supplying device for an endoscope which includes a control section, an insertion section extended from the control section and having a nozzle at its distal end, a light guide cable extended from the control section and having a connector at its distal end, an air supply channel extending in the endoscope and having one end communicating with the nozzle and the other end opening to the connector, and a light guide extending in the endoscope from the distal end of the insertion section to the connector; said liquid supplying device comprising:

a housing with a connecting portion to which the connector of the endoscope is connected;

air and liquid supplying means, arranged inside the housing, for supplying liquid and air into the air supply channel from the other end of the air supply channel;

a light source which is arranged inside the housing and



which emits light which becomes incident on the light guide from that end of the light guide which is near the connector; and

regulating means for preventing the air and liquid supplying means from supplying liquid while the light source is ON.

4,550,717

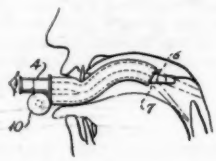
THROAT EXAMINATION DEVICE

Karl Berger, 2357 Woodcrest Dr., Johnstown, Pa. 15905

Filed Apr. 9, 1984, Ser. No. 598,064

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—16 **13 Claims**



1. A device for use by a physician in examining the throat of a patient, and comprising:

a source of light;

means for directing said light to particular areas of the throat for illumination thereof and having a light emitting end;

means for directing an image of said particular areas of the throat to a viewing lens, said image direction means having an image receiving end; and

means for housing said lens, said light directing means, and said image directing means and being configured so that, in use, a portion of said housing is positionable within an alert patient's mouth without causing gagging of the patient, said physician observing said particular areas through said viewing lens which is positioned outside of said mouth and via said image directing means extending into said mouth, said housing portion positioning said light emitting end and said image receiving end above the tongue and adjacent the palate of said patient.

4,550,718

FACIAL MASSAGE DEVICE

Charles Kaeser, Pully, Switzerland, assignor to P. F. Cosmetique, Paris, France

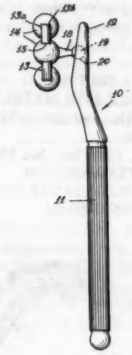
Filed Mar. 21, 1983, Ser. No. 477,334

Claims priority, application France, Mar. 22, 1982, 82 4824

Int. Cl.[4] A61H *15/00*

U.S. Cl. 128—57 **16 Claims**

1. A facial massage device comprising a support and at least one rotary massage ball mounted on said support, characterized by the fact that the support is composed of a handle (**11**) and of a plate (**13**) articulated on said handle, and by the fact that the plate comprises at least one circular opening (**15**) so arranged that said rotary ball (**14**) is retained in said opening while being capable of turning freely in all directions around it, characterized by the fact that the plate is connected to the handle by means of ball joint (**19**) housed in a suitable socket (**20**) in the handle, and further characterized by the fact that



said plate (**13**) is of circular shape and comprises a circular opening (**16**) within which a central ball (**17**) is housed, said ball being connected by at least one rod (**18**) to the ball joint (**19**), in such a manner that the plate is articulated around the central ball and that the assembly consisting of the plate and central ball is articulated on the swivel joint which is connected to the handle.

4,550,719

IMPLANTABLE PENILE ERECTILE SYSTEM

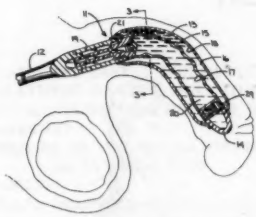
Roy P. Finney, Tampa, Fla.; Robert E. Trick, and Henry W. Lynch, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

PCT No. PCT(US83/00196, § 371 Date Nov. 9, 1983, § 102(e) Date Nov. 9, 1983, PCT Pub. No. WO84/03038, PCT Pub. Date Aug. 16, 1984

Continuation-in-part of Ser. No. 289,879, Aug. 4, 1981, Pat. No. 4,399,811. This PCT application Feb. 14, 1983, Ser. No. 571,902

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—79 **3 Claims**



1. In a penile erectile system including a penile implant having an elongated unitary body with a tip at one end and an anchoring stem at the other end and including an intermediate inner chamber with a radially disposed outer chamber, the inner chamber being non-distensible so that when pressurized and filled with fluid it becomes rigid; a passage providing communication between said inner and outer chambers; pump means within the body for transferring fluid from the outer chamber into the inner chamber to pressurize it and make it rigid and a control valve for controlling the pressure in said

inner chamber, the improvement which comprises an improved control valve located adjacent the tip, said valve including a housing having an inlet communicating with the inner chamber and an outlet communicating with the outer chamber, a sealing member for the inlet in the housing and a precalibrated spring positioned in the housing, between the sealing member and the outlet, said spring normally holding the sealing member against the inlet, said valve automatically opening when the pressure in the inner chamber exceeds the force of the precalibrated spring.

4,550,720

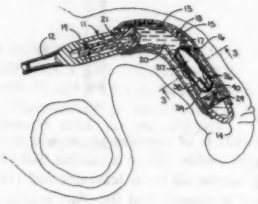
CAPACITANCE DEVICE FOR MEDICAL IMPLANT

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Nov. 15, 1983, Ser. No. 551,876

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—79 **7 Claims**



1. In a medical implant having a hydraulic system including a pressure chamber in which hydraulic pressure must be maintained at a working level, the improvement which comprises capacitance means for compensating for hydraulic fluid loss from the pressure chamber and resultant pressure drops, said capacitance means comprising an impermeable bladder located within said pressure chamber, said bladder being elastic and filled with gas under pressure so that it expands to compensate for any minor hydraulic fluid loss from the pressure chamber.

4,550,721

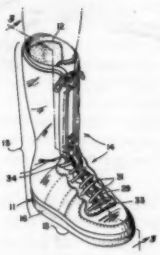
FOOT SUPPORT

Lorraine M. Michel, 613 S. Walter Reed Dr., Apartment 611C, Arlington, Va. 22204

Filed Jul. 1, 1983, Ser. No. 510,318

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 E **16 Claims**



1. A support for maintaining a wearer's foot at approximately a right angle with the wearer's leg comprising (a) a shoe having a sole and an upper which comprises a posterior aspect and which covers a portion of the leg and (b) a brace having a vertical part disposed adjacent to said posterior aspect and a horizontal part adjacent to said sole, wherein

said brace is substantially rigid and fixedly connected to said shoe,

a surface of said brace which is adjacent the foot is provided with a means for releasably engaging the foot or an article of wearing apparel covering the foot,

said upper further comprises an elastic support connected to a first portion of said upper which is adjacent to the metatarsus or phalanges of the foot, and connected to a second portion of said upper which is adjacent to the leg,

a portion of said upper adjacent to the leg is divided substantially vertically to form two sides and said sides are releasably connected with lacing, and

said elastic support is disposed underneath said lacing.

4,550,722

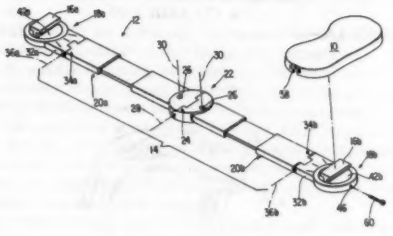
ORTHOPEDIC FOOT SPLINT WITH SWIVEL AND STOP

Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 531,583, Sep. 13, 1983, Pat. No. 4,481,940, which is a continuation of Ser. No. 358,531, Mar. 16, 1982, abandoned. This application Dec. 2, 1983, Ser. No. 557,215

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 A **10 Claims**



1. An orthpedic foot splint which is attached to the shoes of a user comprising:

a pair of shoe engaging plates, each said plate having a longitudinal axis approximately parallel to the longitudinal axis of the shoe which is attachable thereto;

an elongate connecting means for horizontally interconnecting said pair of shoe engaging plates, said connecting means including

(a) two elongate sections, one end of each said elongate section being connected to a respective shoe engaging plate,

(b) longitudinal pivot means comprising the connection between at least one elongate section and shoe engaging plate, and

(c) a central joint means including a longitudinal hinge to permit said sections to move with respect to each other in a plane perpendicular to the axis of said hinge, pivot means disposed perpendicular to said longitudinal hinge for permitting angular movement of one of said elongate sections with respect to the other elongate section on an axis vertically disposed with respect to the axis of said longitudinal hinge, and a restricting means for preventing angular movement of one of said elongate sections beyond a predetermined angle with respect to the longitudinal axis of the other of said elongate sections whereby one shoe engaging plate is prevented from moving in front of the other shoe engaging plate while permitting the other shoe engaging plate to move in front of said one shoe engaging plate.

4,550,723

JOINING ELEMENT FOR FIXATION OF BONE TISSUES

Sergei I. Belykh, 2 Krestovsky pereulok, 4, kv. 66; Anatoly B. Davydov, ulitsa Krasny Kazanets, 19, korpus 1, kv. 28; Igor L. Kovalenko, ulitsa Chapaeva, 7, kv. 30; Lidia Y. Loktionova, ulitsa Skryabina, 25/1, korpus 2, kv. 49, all of Moscow; Anatoly D. Moschensky, Malakhovka, Bykovskoe shosse, 41, kv. 66, Moskovskaya oblast; Gely G. Pershin, Krivorozhskaya ulitsa, 9, kv. 62, Moscow; Grigory N. Pershin, ulitsa Ulbrikhta, 19/10, kv. 75, Moscow; Elena N. Padeiskaya, Lenisky prospekt, 13, kv. 24, Moscow; Lidia M. Polukhina, Alleya Zhemchugovoi, 3, korpus 1, kv. 2, Moscow; Nikolai I. Ochirov, Tashkentskaya ulitsa, 34, korpus 2, kv. 195, Moscow, and Jury I. Filippov, Zaraiskaya ulitsa, 41, kv. 55, Moscow, all of U.S.S.R.

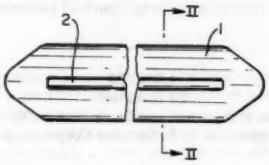
Continuation of Ser. No. 416,320, Sep. 9, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 580,755

Claims priority, application U.S.S.R., Jan. 4, 1979, 2712921

The portion of the term of this patent subsequent to Mar. 8, 2000, has been disclaimed.

Int. Cl.[4] A61F *5/04, 1/00*

U.S. Cl. 128—92 B 4 Claims



1. A joining element for fixation of bone tissues comprising on oblong solid provided with a recess having an insert in said recess, said insert comprising a biologically compatible polymer which is degraded and absorbed into the body, and from about 19 to about 29 weight percent of a physiologically active medicine based on the weight of said insert.

4,550,724

ORTHOPEDIC VEST FOR SUPPORT AND RESTRAINMENT IN THE TREATMENT OF SUBJECTS TO TRAUMA AND SURGERY OF THE SHOULDER, SCAPULAR ARCH AND UPPER LIMB

Mohamed Berrehail, Immeuble Royal, Les Doux-Alpes (Isere), France

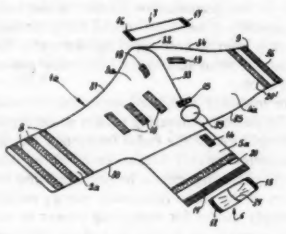
PCT No. PCT/FR82/00071, § 371 Date Dec. 28, 1982, § 102(e) Date Dec. 28, 1982, PCT Pub. No. WO82/03767, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 14, 1982, Ser. No. 456,020

Claims priority, application France, Apr. 28, 1981, 81 08625; Dec. 14, 1981, 81 23781

Int. Cl.[4] A61F *13/00, 5/40*

U.S. Cl. 128—133 19 Claims



1. An orthopedic vest for support and restraint of the shoulder, the scapular arch and the upper arm limb, comprising: three joined panels including a first panel having a back portion for restraint of the rear portion of the thorax, and extending laterally to a chest portion for the restraint of the front portion of the thorax, the front part of the shoulder, and the upper arm limb, said chest portion extending laterally to a second panel for the restraint of the rear part of the shoulder and the upper arm limb and for receiving at least one part of said first panel and keeping same in place, said chest portion being extended over a lower portion thereof by a third panel forming with said chest portion a rest for the forearm, said panels being provided on both faces thereof with closing and progressive fastening means allowing the vest to be used without difference on the left side and on the right side of the wearer by simple reversal thereof, said first and second panels acting to enclose the shoulder and upper arm limb and being further provided with an opening formed in a lower portion of said first and second panels for the passage of the forearm.

4,550,725

METHOD AND APPARATUS FOR ABSORBING MOISTURE

Marvin Wishman, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 260,473, May 4, 1981, , which is a continuation of Ser. No. 844,350, Oct. 21, 1977, abandoned. This application Nov. 30, 1983, Ser. No. 556,672

Int. Cl.[4] A61F *13/00;* A61L *15/00*

U.S. Cl. 128—155 6 Claims

1. A bandage comprising:

a sterilizable compress in the form of a batt of nonwoven fabric including a plurality of staple polypropylene fibers, a first portion of said polypropylene fibers being unfused on a first side of said fabric and forming liquid-pervious unfused fiber facing means for engaging a liquid-bearing surface, and a second portion of said polypropylene fibers being fused on the opposite side of said fabric separated from the liquid-bearing surface by said first portion of said polypropylene fibers, whereby liquid absorbed by said liquid-pervious unfused fiber facing means migrates through the unfused fibers toward the fused fibers; and

a flexible backing sheet disposed adjacent to the opposite side of said batt of nonwoven fabric, wherein said backing sheet is formed of a flexible plastic material adhered on one side therof to the fused side of said nonwoven fabric and having adhesive means on said one side thereof for securing said bandage with said compress engaging a wound.

4,550,726

METHOD AND APPARATUS FOR DETECTION OF BREATHING GAS INTERRUPTIONS

James A. McEwen, 8371 No. 4 Rd., Richmond, British Columbia, Canada V6Y 2T7

Filed Jul. 15, 1982, Ser. No. 398,716

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—202.22 19 Claims

11. Apparatus for detecting an interruption in the supply of breathing gas to a patient, said apparatus comprising:

pressure sensing means for sensing the pressure in the patient's breathing gas during a breathing cycle of a patient and for producing an output signal representative thereof;

means for deriving breathing information including a reference breathing cycle waveform parameter from said output signal during a predetermined time period within at least one of said breathing cycles significant of a reference time period during which a normal breathing cycle of a patient occurs;

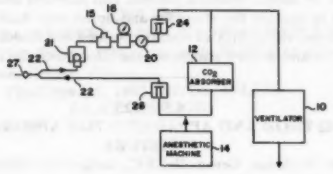
memory means for storing said reference breathing informa-

tion including said reference breathing cycle waveform parameter derived from said output signal during said reference time period;

means solely actuable by an operator for initiating the reference time period to cause storage of said reference breathing information including said reference breathing cycle waveform parameter;

means for deriving active breathing information including an active breathing cycle waveform parameter from said output signal after said reference time period;

signal comparison means for comparing:



active breathing information including said active breathing cycle waveform parameter derived from said output signal after said reference time period; with

said reference breathing information including said reference breathing cycle waveform parameter derived from said output signal; and,

alarm means for producing an alarm signal upon detection, by said comparison means, of a predetermined variation between said breathing cycle waveform parameters of said active breathing information and said reference breathing information.

4,550,727

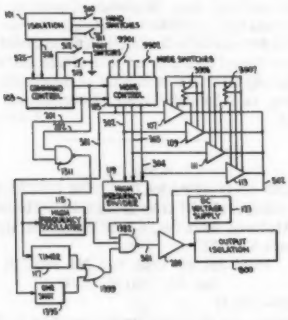
ELECTROSURGICAL GENERATOR

Frederick W. Rexroth, Dunedin, Fla., assignor to Medical Research Associates, Ltd. #2, Clearwater, Fla.

Continuation-in-part of Ser. No. 447,808, Dec. 8, 1982, Pat. No. 4,473,075. This application Jul. 8, 1983, Ser. No. 512,044

Int. Cl.[4] A61B *17/39*

U.S. Cl. 128—303.14 **9 Claims**



1. An electrosurgical generator for delivering a high frequency cutting signal to a surgical site comprising a human joint having a first impedance, without damaging softer tissue having a second lower impedance and surrounding said joint, said electrosurgical generator comprising:

actuable source means responsive to application of a control signal thereto for providing a high frequency cutting signal;

terminal means responsive to application of said high frequency cutting signal thereto for delivering the applied cutting signal to said surgical site;

selectively actuable control means for providing selective application of said control signal to said source means; and

impedance matching means interposed between said source means and said terminal means for establishing the effective output impedance of said source means, said effective output impedance being selected to be substantially equal to said first impedance and substantially higher than said second impedance such that said source means efficiently transfers energy in said cutting signal to said joint and transfers comparatively negligible energy to said surrounding tissue;

wherein said first impedance is in the range between 1100 and 1400 ohms;

wherein said impedance matching means is a transformer circuit having an output impedance value equal to said first impedance;

said electrosurgical generator further comprising:

rapid start means responsive to said control signal for applying said high frequency cutting signal to said terminal means continuously for a predetermined time interval; and

further means responsive to expiration of said predetermined time interval for cyclically and alternatively applying and inhibiting application of said high frequency cutting signal to said terminal means such that each cycle of application and inhibition is very much shorter than said predetermined time interval.

4,550,728

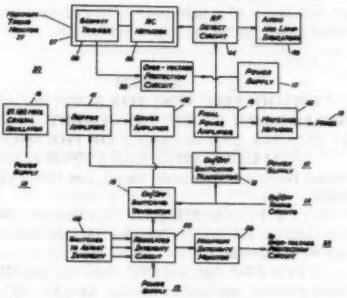
EPILATOR

Wayne Runyon, Ridgewood, and Larry Hower, New York, both of N.Y., assignors to L. P. Systems Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,456

Int. Cl.[4] A61B *17/41*

U.S. Cl. 128—303.18 **20 Claims**



1. Epilator apparatus for outputting epilator pulses to a germinative portion of hair, comprising:

an insulated bulbous probe for delivering radio frequency energy to the germinative portion of the hair;

radio frequency generating means for generating the radio frequency energy and applying the radio frequency energy output from said radio frequency generating means to said probe;

maximum intensity monitor circuit means coupled to said radio frequency generating means to determine the maximum amplitude of the radio frequency energy output;

timing monitor circuit means coupled to said radio frequency generating means to predetermine the maximum duration of the radio frequency energy output; and

power supply means for supplying power to said radio frequency generating means including overvoltage means responsive to said maximum timing monitor circuit means and said maximum intensity monitor circuit means for cutting off power to said radio frequency generating means when a voltage is reached by said intensity monitor

circuit means or said timing monitor circuit means in excess of a pre-set value.

4,550,729

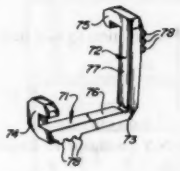
NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS WITH INTERLOCKING LATCH MEANS

Robert J. Cerwin, Pittstown, N.J.; Madhusudan Joshi, E. Aurora, N.Y.; John R. Menges, Woodbridge, N.J.; Robert W. Mericle, Lebanon, N.J., and William J. Zwaskis, Carteret, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 296,672, Aug. 27, 1981, Pat. No. 4,449,531. This application Mar. 5, 1984, Ser. No. 586,376

Int. Cl.[4] A61B *17/12, 17/00*

U.S. Cl. 128—325 **2 Claims**



1. A hemostatic clip comprising first and second leg members, each leg member having an elongated vessel clamping inner face in opposition to a vessel clamping inner face of the other leg member, said first leg member terminating at its distal end in a bend forming a hook member extending from said vessel clamping inner face, said second leg member terminating at its distal end in a complementary bend forming a complementary hook member for engagement by said hook member of said first leg member, resilient hinge means joining said first and second leg members at their proximal end, the hook member of the first leg member extending towards said resilient hinge means and the hook member of said second leg member extending at an angle to said resilient hinge means, said first and second leg members being rotatable about said hinge means from an open position wherein said legs diverge from one another to a closed position wherein said legs are substantially parallel, said hook members being disposed complementary with regard to one another to interlock the legs in the closed position and maintain said legs substantially parallel and to prevent lateral movement between the vessel clamping inner faces of the leg members when the clip is in the closed position.

4,550,730

FLEXIBLE MONOFILAMENT SURGICAL SUTURES COMPRISING POLY(POLYMETHYLENE TEREPHTHALATE, ISOPHTHALATE OR CYCLOHEXANE-1,4-DICARBOXYLATE-CO-DIMERATE)

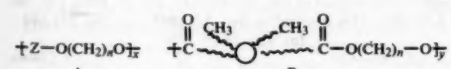
Shalaby W. Shalaby, Lebanon, and Edgar S. Schipper, Cranford, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 328,351, Dec. 7, 1981, abandoned. This application Nov. 28, 1983, Ser. No. 555,746

Int. Cl.[4] A61L *17/00;* **C08F** *34/00*

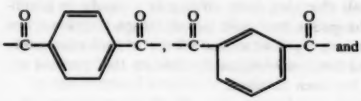
U.S. Cl. 128—335.5 **10 Claims**

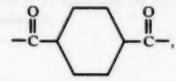
1. A drawn and oriented, flexible thermoplastic surgical filament, comprising a copolymer consisting essentially of a multiplicity of random recurring A [poly(polymethylene terephthalate, isophthalate or cyclohexane-1,4-dicarboxylate)] and B [poly(polymethylene dimerate)] units having the following general formula:



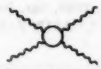
A B

wherein—Z—represents a member selected from the group consisting of





n is 4 to 8, x and y are numbers having average values such that the A units comprise 87 to 92 mole percent, and the B units comprise 13 to 8 mole percent of the copolymer, and



denotes a branched hydrocarbon chain containing from 24 to 32 carbon atoms, in which a size 3/0 strand of said filament has the following combination of mechanical properties:

Knot strength—at least about 35,000 psi

Tensile strength—at least about 60,000 psi

Young's modulus—between about 80,000 and 280,000 psi

Elongation—from about 20% to 80%

4,550,731

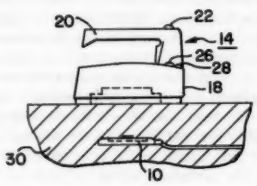
ACQUISITION CIRCUIT FOR CARDIAC PACER

William P. Batina, and Robert M. White, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Mar. 7, 1984, Ser. No. 587,262

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PT **16 Claims**



1. A cardiac pacing system including an acquisition circuit for a cardiac pacer to indicate when an external telemetry head is adequately positioned over an electronic stimulator implanted in a human body for data transmission comprising:

oscillator means for producing an externally generated magnetic signal at a first predetermined frequency;

enabling means for generating a second signal at a second predetermined frequency which is lower than said magnetic signal;

drive means for combining said magnetic and second signals to provide a third signal containing said second signal enveloping said magnetic signal for each half cycle;

an implantable pacer including an inductor coil means tuned to said magnetic signal frequency for generating an induced signal in the presence of said magnetic signal at the same frequency to which said coil means in tuned, means for providing, to said induced signal, a phase-shift relative to said magnetic signal dependent upon the distance of said pacer to said telemetry head;

circuit means responsive to said magnetic signal and said

induced signal for generating pulse signals when said telemetry head is over said electronic stimulator; and

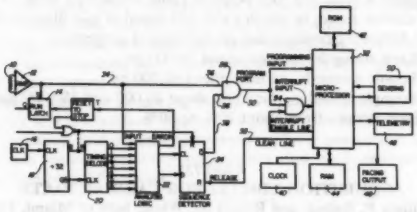
indicating means coupled to said circuit means for transmitting signals changing from pulsing to a steady on condition as the pulses from said circuit means increase when said telemetry head is moved closer to and adequately positioned over said implant to indicate that positive acquisition has been obtained.

4,550,732

SYSTEM AND PROCESS FOR ENABLING A PREDEFINED FUNCTION WITHIN AN IMPLANTED DEVICE

John R. Batty, Jr., and Chester D. Slocum, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Mar. 23, 1984, Ser. No. 592,412
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **24 Claims**



1. A system for enabling a predefined function within a device implanted in a patient from an external command unit, comprising:

an external command unit for generating external signals including a first access signal and a command signal;

an implanted device having means for receiving external signals, means for receiving external command signals, means for storing a temporarily operated selected routine to be generated in response to a command signal from the external command unit, means for decoding the first access signal to prevent access to the routine storing means unless the first access signal is received, and means for detecting the command signal to prevent access to the routine storing unless both the first access signal and the command signal are received, whereby the temporarily operated selected routine is generated only if both the first access signal and the command signal are received.

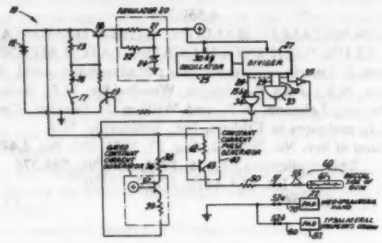
4,550,733

ELECTRONIC DENTAL ANALGESIA APPARATUS AND METHODOLOGY

Saul Liss, and Bernard S. Liss, both of Glen Rock, N.J., assignors to Pain Suppression Labs, Inc., Elmwood Park, N.J.

Filed Jan. 9, 1984, Ser. No. 569,476
Int. Cl.[4] A61N *1/34*
U.S. Cl. 128—421 **3 Claims**

1. A method for suppressing pain otherwise associated with a dental procedure in a subject's oral cavity including the steps of securing a first electrode at the buccal side of the gum of a subject adjacent the work area, securing second ad third electrodes connected electrically in common to the web of the subject's ipsalateral hand and to the subject's ipsalateral trapezius origin, and supplying an electrical wave comprising a high



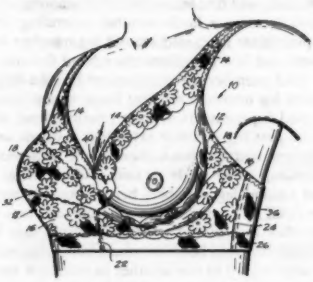
frequency amplitude modulation to said first, and said second and third electrodes.

4,550,734

BRASSIERE

Frank Porco, Bronx, N.Y., assignor to Exquisite Form Industries, Inc., New York, N.Y.

Filed Sep. 28, 1983, Ser. No. 536,854
Int. Cl.[4] A41C *3/04*
U.S. Cl. 128—460 **19 Claims**



1. A nursing brassiere having openable breast cups connected to side panels and having shoulder strap means, comprising: a plurality of panels forming each of said breast cups; and each said breast cup having at least one bust panel section, and a fold-over panel; said fold-over panel at least partially overlying said bust panel section; said fold-over panels being joined to each other between said breast cups, and to said brassiere along seam lines, and being free of any fastener and at least a portion of said fold-over panel being unattached to any other panel sections so as to enable said fold-over panel to be stretched or deformed along the unattached edge, using one hand to open said breast cup and expose a breast; whereby upon a breast cup being opened, said cup is maintained in the open position by the exposed breast.

4,550,735

ELECTRODE FOR AN ELECTROCARDIOGRAPH

Norio Akamatsu, 1-8, Higashiyoshinocho 2-Chome, Tokushima-shi, Tokushima, Japan (770), and Yasuhiro Toyosu, 15-5, Minamikomatsushimacho, Komatsushima-shi, Tokushima, Japan (773)

Continuation-in-part of Ser. No. 405,955, Jul. 29, 1982, Pat. No. 4,517,983. This application Sep. 13, 1983, Ser. No. 531,643
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 **6 Claims**

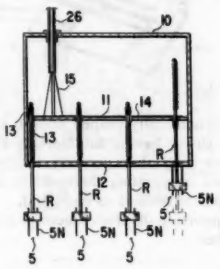
1. An electrode means for an electrocardiograph used for measuring potentials of a number of points of a body surface

near the heart and producing an isopotential map thereof, said electrode means comprising:

a plurality of rods movably mounted for reciprocal movement in the direction of the lengths thereof;

resilient members, one connected to each rod, for resiliently urging one end of each rod in the direction of its length toward the human body surface;

a pin contact set on said one end of each rod, each pin contact set having a plurality of parallel pin contacts, each pin contact being conductive at least on its surface and each pin contact being movably mounted for movement reciprocally in the direction of its length for directly contacting the human body surface;



further resilient members, one connected to each pin contact, for resiliently urging the end of each pin contact in the direction of its length toward the human body surface;

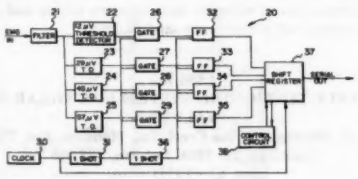
the pin contacts of each set being mounted in a small area close to one another on said rod and being mutually electrically connected in parallel, the space between the pin contacts of each pin contact set being much smaller than the space between the adjacent small areas of the pin contact sets, whereby the potential at a position on the body surface contacted by a pin contact set can be detected as long as one pin contact in the set is in good contact with the body, even if the other pin contacts in the set are in bad contact.

4,550,736

MOVEMENT ARTIFACT DETECTOR FOR SLEEP ANALYSIS

Roger Broughton, and Bernardo da Costa, both of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Oct. 10, 1984, Ser. No. 659,295
Claims priority, application Canada, Oct. 14, 1983, 439061
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—731 **5 Claims**



1. A movement detector for a sleep analyser comprising:

means for receiving an electroencephalogram (EEG) signal;

first monitoring means for detecting only components in the EEG signal having a real-time frequency greater than approximately 30 Hz and greater than a first predetermined amplitude;

a second monitoring means for detecting only components in the EEG signal having a real-time frequency greater than approximately 30 Hz and a second predetermined amplitude smaller than the first predetermined amplitude;

third monitoring means for detecting only components in the EEG signal having a real-time frequency less than approximately 1.2 Hz and a third predetermined amplitude at least an order in magnitude greater than the first predetermined amplitude; and

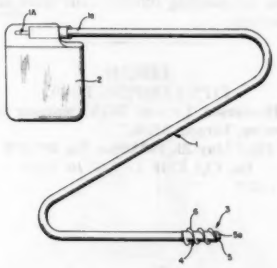
means connected to the first, second and third monitoring means for providing an output only if at least one of the predetermined components are detected.

4,550,737

INTRAVENOUSLY IMPLANTABLE ELECTRODE LEAD FOR USE WITH CARDIAC PACEMAKERS

Peter Osypka, Hornrain 31, D-7889 Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,389
Int. Cl.⁴ A61N *1/04*
U.S. Cl. 128—785 **19 Claims**



1. An intravenously implantable electrode lead for transmission of stimuli from a cardiac pacemaker to a selected portion of a patient's heart, comprising elongated flexible conductor means for conducting the stimuli from the pacemaker to the selected portion of the heart, said conductor means having a first end portion adapted to be located nearer to and a second end portion adapted to be located distal from the pacemaker, and said second end portion being provided with a stimulation surface; and means for anchoring the distal end portion of the conductor means in the heart, including a screw consisting at least in part of yieldable soft material and surrounding the distal end portion of the conductor means behind the stimulation surface, said screw comprising a screw thread having a root adjacent to and a tip remote from the distal end portion of the conductor means, and said screw thread tapering in a direction from said root to said tip so that the latter is narrower than said root.

4,550,738

SANITARY ASHTRAY SYSTEM

Herman C. Estey, P.O. Box 3024, Longwood, Fla. 32750

Filed Mar. 26, 1984, Ser. No. 593,657
Int. Cl.⁴ A24F *19/14*
U.S. Cl. 131—236 **5 Claims**

1. An ashtray system comprising:

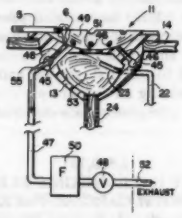
a reservoir for holding a supply of water;

a plurality of ash receivers, each of said receivers comprising an ashtray and a water chamber, each said ashtray having groove means for holding cigarettes eahc said chamber being separate from and disposed below each said ashtray; each said ashtray having an opening in the lower portion thereof communicating with the corresponding one of said chambers, each said chamber having a drain attached to a lower portion thereof and a water jet disposed along one wall thereof;

first pump means for drawing water from said reservoir;

a waterline connected from an output of said pump to said water jet of each of said ash receivers for supplying water under pressure to said jet;

a filter;



a drainline connected between said drain of each of said ash receivers and said filter; and

second pump means connected to said filter and to said reservoir for pumping filtered water from said filter into said reservoir.

4,550,739

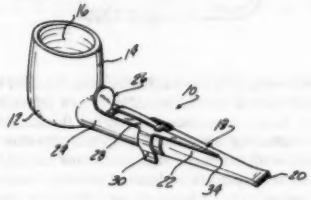
PIPE TAMPING TOOL

George H. Henderson, Lennon, Mich., assignor to G.E.M.M. Manufacturing, Vernon, Mich.

Filed May 23, 1983, Ser. No. 497,079

Int. Cl.⁴ A24F *3/02, 9/10, 9/14*

U.S. Cl. 131—247 **5 Claims**



1. A pipe tamping tool, comprising:

(a) means for tamping tobacco within a bowl of a pipe;

(b) means for cleaning the interior of a bowl of a pipe; and

(c) means for retaining a bowl of a pipe in a vertical position when a pipe is placed upon a horizontal surface, the means for retaining comprising:

(1) an arcuate member having an arc less than 360° and which envelopes the stem of a pipe; and

(2) a leg formed at each free end of the arcuate member and which radiates outwardly therefrom.

4,550,740

MOUTHPIECE FOR A CIGARETTE AND A CIGARETTE HAVING SAME

Tilford F. Riehl, Jr., Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 5, 1983, Ser. No. 558,414

Int. Cl.⁴ A24D *3/04*

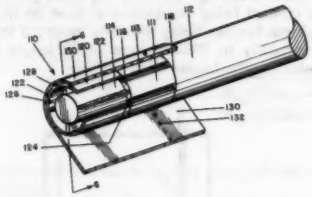
U.S. Cl. 131—336 **10 Claims**

1. A mouthpiece adapted to be attached to a cigarette tobacco column comprising:

a generally cylindrically shaped filter plug adapted to be coaxially located at one end of the cigarette tobacco column, the filter plug having substantially the same diameter as the tobacco column;

means defining a plurality of generally longitudinally extending grooves in the peripheral surface of the filter plug, the grooves extending from one end to the other end of the filter plug;

an air and smoke impermeable core member having at least one end of generally circular shape of a diameter smaller than the diameter of the filter plug coaxially disposed to the end of the filter plug opposite the tobacco column with the at least one circular end in juxtaposition with the end of the filter plug;



a generally cylindrically shaped hollow air and smoke impermeable sleeve having substantially the same diameter as the filter plug concentrically located over the core member and cooperating therewith to define an annular channel open at both of its ends; and,

means for supporting the sleeve member in position over the core member.

4,550,741

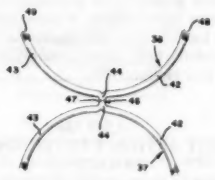
DEVICE FOR CLEANING TEETH TO PREVENT THE FORMATION OF PLAQUE

Mark D. Krag, Los Gatos, Calif., assignor to Dental Preventech, Inc., Santa Clara, Calif.

Continuation of Ser. No. 215,811, Dec. 12, 1980, abandoned. This application Feb. 21, 1984, Ser. No. 580,331

Int. Cl.⁴ A61C *15/00*

U.S. Cl. 132—89 **10 Claims**



1. A device for cleaning teeth, comprising:

(a) a pair of flexible limp strands of substantially equal length having corresponding end portions in close proximity; and

(b) means joining said corresponding end portions to complete a closed loop;

(c) said means joining said corresponding end portions comprising a pair of adhesive tabs between which said corresponding end portions are sandwiched.

4,550,742

VARIABLE TENSIONING SYSTEM FOR SHEAR SEAL VALVES

Stanley D. Stearns, 15 Pine Creek La., Houston, Tex. 77055

Filed Jan. 23, 1984, Ser. No. 572,746

Int. Cl.⁴ F17D *1/16*

U.S. Cl. 137—14 **17 Claims**

1. An instrumentation valve comprising:

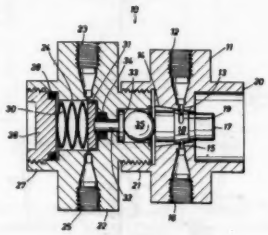
(a) a first housing comprising a valve body having a first fluid flow passage therethrough cooperatively arranged relative to a valve seat;

(b) a valve element adapted to be seated against said valve seat and having first and second operative positions, one position opening said first fluid flow passage through said

valve body for fluid flow and the other position closing said first fluid flow passage against fluid flow, said first housing enclosing said valve element therein against said valve seat;

(c) a second housing joined to said first housing, said second housing having a second fluid flow passage therethrough operatively connected with said first fluid flow passage;

(d) valve element bias means providing a relatively fixed force, said bias means bearing against said valve element to relatively urge said valve element into sealing engagement with said valve seat to enable fluid flow up to a minimum pressure to flow through said first fluid flow passage and past said valve seat without leakage;



(e) fluid pressure responsive means in said second housing cooperatively arranged relative to said second fluid flow passage including a fluid pressure receiving chamber means adapted to be connected to the source of fluid to be switched by the valve, said chamber means further including coupling means extending from said chamber means to said valve element to provide a variable force to said valve element responsive to fluid pressure in said second fluid flow passage to variably load said valve element as a function of the pressure of the fluid to be switched; and

(f) said first and second fluid flow passages being cooperatively connected to permit fluid to flow from the source of fluid to be switched through the second fluid flow passage in said second housing and then through said first fluid flow passage in said first housing.

4,550,743

BURSTING DISC ORIENTATION DEVICE

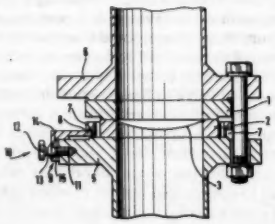
Glenton P. McFarlane, Wembley, and Steven G. Swift, Chelmsford, both of England, assignors to Johnson Matthey plc, London, England

Filed Jun. 3, 1983, Ser. No. 500,690

Claims priority, application United Kingdom, Jun. 4, 1982, 8216294

Int. Cl.⁴ F16K *13/04*

U.S. Cl. 137—68.1 **4 Claims**



1. A device for restricting the relative position of a bursting disc unit between a pair of pipe flanges, said unit comprising a pair of annular collars with a frangible disc clamped therebetween, said device comprising a cut-away portion on a predetermined one collar of the bursting disc unit and a projection, which is cooperable with the cut-away portion and which is attached to or forms a part of that pipe flange against which the said one collar is required to bear whereby the unit can be prevented from being located between the pipe flanges in other than a predetermined orientation in which the projection is located in the cut-away portion, the projection comprising an angle bracket having a first arm, which is securable to the periphery of the flange and a second arm, which is locatable radially inwardly with respect to the periphery and disposable in the cut-away portion in the collar.

4,550,744

PIEZOELECTRIC HYDRAULIC CONTROL VALVE

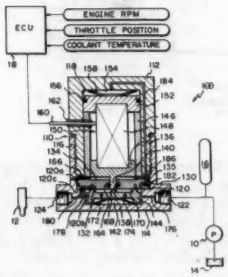
Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Toru Yoshinaga; Seiko Abe, both of Okazaki, and Kazuhide Watanabe, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 14, 1983, Ser. No. 551,693

Claims priority, application Japan, Nov. 16, 1982, 57-199706; Nov. 30, 1982, 57-210793

Int. Cl.⁴ F16K *17/38*

U.S. Cl. 137—80 **24 Claims**



1. A piezoelectric hydraulic control valve, comprising:

(a) a housing having an axially-extending, closed-end central bore and having an inlet port for receiving pressurized fluid and an outlet port for delivering said pressurized fluid and a fluid passage communicating said inlet and said outlet port;

(b) a valve seat in said housing and extending across said passage;

(c) a movable valve member cooperating with said valve seat;

(d) a column of piezoelectric material received coaxially within said bore and having an upper and a lower end;

(e) means for applying a voltage to said piezoelectric column to induce axial expansion of said column;

(f) connecting means provided between said lower end of said column and said valve member for transmitting axial expansion of said column to said valve member to thereby open and close said fluid passage;

(g) a thermal expansible sleeve received within said bore concentrically with said column, having a coefficient of linear expansion equal to that of said piezoelectric column and having an upper and a lower end, said lower end of said sleeve being fixedly supported by said housing but other portions of said sleeve being loosely fitted within said bore to permit said upper end of said sleeve to displace axially in response to thermal expansion of said sleeve due to a variation in the ambient temperature; and

(h) movable supporting means, received movably within said bore and attached to the upper end of said sleeve, for maintaining said lower end of said column at a constant distance from said valve member regardless of ambient temperature variations by supporting said upper end of said piezoelectric column such that is displaces together

with said upper end of said sleeve, whereby expansion and contraction in one direction of said sleeve compensates for the expansion and contraction, due to ambient temperature variation, in the opposite direction of said piezoelectric column, thereby maintaining said constant distance.

4,550,745

DEVICE FOR DISCHARGING A MIXTURE OF TWO LIQUIDS

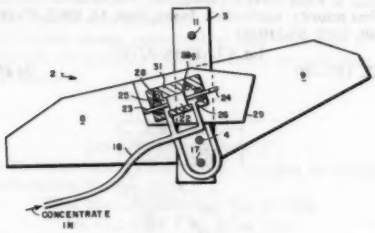
Michael G. Stratford, and Harry C. Spencer-Watkins, both of Tring, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 29, 1982, Ser. No. 454,417

Claims priority, application United Kingdom, Jan. 5, 1982, 8200131; Aug. 12, 1982, 8223186

Int. Cl.[4] G05D *11/04*

U.S. Cl. 137—99.5 **2 Claims**



1. A device for replenishing an animal dipping tank with a mixture of first and second liquids, the device comprising, a first inlet for the first liquid; a second inlet for the second inlet, said second inlet comprising a pump having at least one cylinder, piston and piston rod; a two-compartment rocking pan mounted for reciprocal rocking movement between first and second positions about an axis located below the top of the compartments, the first position being such that a first said compartment receives the first liquid and the second position being such that the second said compartment receives the first liquid, said rocking movement being effected by the successive filling of the said two compartments and being such as to empty at least partially the compartment which has just been filled; the pump being mounted to rock in consonance with the rocking pan and the piston rod of said pump being struck against a stop by each reciprocation of the rocking pan such that a measured quantity of the second liquid is ejected from the pump into the said compartment about to receive the first liquid.

4,550,746

REGULATOR FOR MOUNTING ON THE OUTLET CONNECTION OF A GAS CYLINDER OR LIKE CONTAINER

Frits U. Hansen, Rungsted Kyst, and Ove Jensen, Helsingor, both of Denmark, assignors to Kosan Teknova A/S, Niva, Denmark

Filed Aug. 3, 1984, Ser. No. 637,712

Claims priority, application Denmark, Aug. 11, 1983, 3662/83

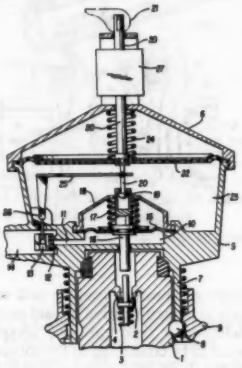
Int. Cl.[4] F16K *17/00*

U.S. Cl. 137—461 **1 Claim**

1. A regulator adapted to be mounted on the outlet connection (1) of a gas cylinder; comprising a housing (5, 6) releasably connectable to said outlet connection and having a spring-biased spindle (16) for controlling a self-closing valve (2) in the outlet connection, and a spring-biased diaphragm (22) forming a wall of a low-pressure chamber (23) and adapted to control a valve (13) upstream of the outlet (14) of the regulator in response to the pressure in the low-pressure chamber,

said control spindle (16) being operatively coupled, via a connecting rod (20) movable in unison with the diaphragm (22), to a manually operable open/close-selector (21),

said selector (21) being pivotally supported on a bearing pin (35) secured in the top part (6) of the housing and oriented transversely of the connecting rod (20), and having a cam face (37) which is eccentric relative to the bearing pin (35) so that the selector may be pivoted between a first position in which the control spindle (16) is lifted clear of the valve (2) in the outlet connection against the force of the biasing spring (17) acting on the spindle, and a second position in which the spindle is free to perform an automatic control of said valve (2), characterized in



that the cam face (37) of the selector cooperates with an axially displaceable spring retainer (29) associated with a compression spring (28) interposed between that retainer and the housing,

and that the selector (21) comprises a spring-biased, manually releasable locking pin (38) which in the open-position of the selector engages in a bore (33) in the spring retainer (29), which bore (33) also receives the end portion of the connecting rod (20), whereby an upward movement of the rod causes automatic disengagement of the locking pin.

4,550,747

DIGITAL FLUID PRESSURE FLOW RATE AND POSITION CONTROL SYSTEM

Raymond D. Woodworth, San Clemente; James F. Stoutamore, Norwalk, and Philip S. Vanderhoek, Anaheim, all of Calif., assignors to Digital Hydraulics, Inc., Costa Mesa, Calif.

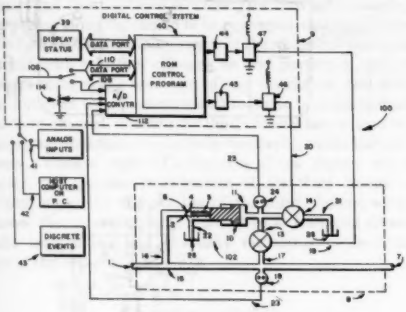
Filed Oct. 5, 1983, Ser. No. 539,299

Int. Cl.[4] G05D *16/00*

U.S. Cl. 137—487.5 **18 Claims**

1. In a fluid pressure control system including a flow control pressure amplification valve having a first port, a second port, a moveable closure element interposed therebetween operated by fluid at a control pressure and in communication with said first port, the improvement comprising a relief line, a control pressure enhancement valve in flow communication with said first port and with said pressure amplification valve, a control pressure reduction valve in fluid communication with said control pressure enhancement valve, said pressure amplification valve and said relief line, a control pressure enhancement solenoid coupled to operate said control pressure enhancement valve, a control pressure reduction solenoid coupled to operate said control pressure reduction valve, a command signal source for providing a digital command control pressure signal corresponding to a desired flow rate between said first and second ports, a control pressure feedback transducer coupled in line between said control pressure enhancement and reduction valves to provide a feedback signal indicative of actual

pressure at said control pressure enhancement and control pressure reduction valves of a magnitude amplified by said pressure amplification valve to a factor greater than one for enhanced sensitivity, and electronic digital control means which receives said command control pressure signal and said feedback signal and responsively selects one of said solenoids



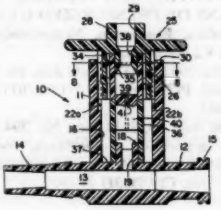
to provide thereto an error correction signal of duration controlled in accordance with the magnitude of initial difference between said command control pressure signal and said feedback signal and a predicted time at which said difference will approach zero, as determined by iterative resampling of said difference and comparison thereof with a predetermined portion of said initial difference.

4,550,748

FLUID FLOW REGULATING UNIT FOR INTRAVASCULAR CATHETER SYSTEMS

Chris E. Nunez, Sandy, Utah, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 8, 1983, Ser. No. 483,398
Int. Cl.[4] A61M *5/00*
U.S. Cl. 137—605 **13 Claims**



1. A fluid flow regulating and control unit for intravascular catheter systems used to infuse fluid, medication and the like in medical and surgical procedures comprising,

a. a control housing having an operating chamber formed therein at one end and being open opposite thereto,

b. a closure member slidably connected in the open end of the control housing for limited inward and outward movement relative to said operating chamber,

c. said closure member having an inlet fluid passage for the fluid to be controlled,

d. said control housing having an outlet manifold for the controlled fluid with at least one connector thereon for connection to the associated intravascular catheter system, and a continually open connecting port communicating at one end with the outlet manifold,

e. an annular resilient member in the operating chamber connected at one end to the control housing about the connecting port and at the opposite end to the closure member, and the inner wall of the annular resilient member forming a fluid flow passage between the inlet fluid passage and the connecting port for the controlled fluid,

f. a restrictor member mounted in interference fit with the inner wall of the annular resilient member, and

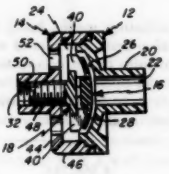
g. said closure member and said annular resilient member operatively connected to each other to permit the closure member to exert axial forces on the annular resilient member to deform the same whereby the controlled fluid will flow around the restrictor member to the continuously open connecting port and into the associated outlet manifold for delivery to the intravascular system.

4,550,749

ADJUSTABLE CHECK VALVE

Donald J. Krikorian, Cranston, R.I., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Mar. 12, 1984, Ser. No. 588,289
Int. Cl.[4] E16K *15/14*
U.S. Cl. 137—843 **10 Claims**



1. A check valve comprising:

a housing defining a chamber, the housing having an inlet and an outlet, said inlet extending along a central axis;

said outlet being displaced transversely from the central axis;

a valve seat surface formed within the housing coaxially about the inlet;

a flexible, resilient disk adapted to bear against the valve seat surface in a dished configuration in which the peripheral edge and peripheral margin of the disk normally engages the valve seat surface;

means for supporting the disk from the downstream side of the disk, said means comprising a post mounted to the housing downstream of the disk, the post being disposed axially along the central axis, the post having a head end for engaging and supporting the disk in a manner which enables the peripheral portion of the disk to flex, said disk supporting means being constructed and arranged as to bias the disk toward the seating surface to seal at least the peripheral edge of the disk against the seating surface; and

means mounting the post to the housing for movement toward and away from the seating surface and along the central axis for varying the degree to which the disk is biased toward the seating surface and for varying the surface area of engagement of the disk with the seat.

4,550,750

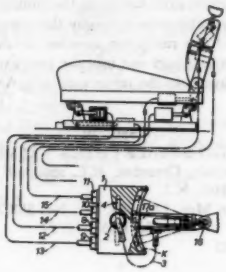
HYDRAULIC FLUID DISTRIBUTOR

Jürgen Korth, Hanover, Fed. Rep. of Germany, assignor to P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,340
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333745
Int. Cl.[4] F16K *11/10*
U.S. Cl. 137—868 **6 Claims**

1. A distributor device for pressurised medium, including a pressurised medium inlet connection, a distributor line connected to said inlet connection, a plurality of adjacently disposed pressurised medium outlet connections adapted to be

connected to a corresponding plurality of pressure cylinders via lines, a corresponding plurality of valves of a push-rod type, and actuating means adapted to be operable to open each said valve against a spring force, a pump having a housing and a discharge line connected to said distributor line via said inlet



connection, said actuating means being the housing of said pump, each said valve being associated with a respective one of said pressure medium outlet connections, each said valve when actuated into an open condition permitting pressurised medium connection between said distributor line and said associated pressurised medium outlet connection.

4,550,751

BALLAST EXHAUST PIPE CLOSING APPLIANCE FOR A SHIP

Hayato Shimamura, Yokohama, and Osamitsu Maeda, Higashino, both of Japan, assignors to Misuzu Machineries & Engineering Ltd., Hyogo and Toner Tanker K.K., Tokyo, both of, Japan

Filed Nov. 17, 1982, Ser. No. 442,437

Claims priority, application Japan, Nov. 17, 1981, 56-171547[U]

Int. Cl.⁴ F16L *55/12*

U.S. Cl. 138—93 **1 Claim**

1. A pipe closing appliance which closes temporarily an outward opening of a pipe, comprising:

a closing stopper which has two end faces and which is an inflatable, cylindrical bag body insertable in said outward opening,

a first communicating slender pipe means for supplying compressed air and for withdrawing leaked fluid, said first pipe means passing through the bag body along a central longitudinal axis of the bag body,

a first feed and exhaust hose connected at one end face of said closing stopper to said bag body such that both communicate with each other,

a second feed and exhaust hose connected at one end face of said closing stopper to said first communicating slender pipe means such that both communicate with each other,

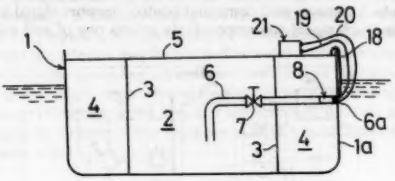
a change-over control means, connected to ends of said two feed and exhaust hoses, for switching compressed air feed and exhaust for said two feed and exhaust hoses,

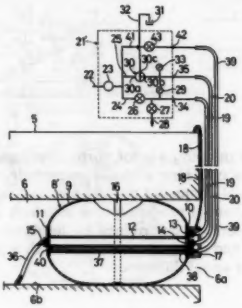
a second communicating slender pipe means for supplying compressed air in said closing stopper in such a fashion that it is substantially in parallel with said first communicating slender pipe means and passes through the bag body,

an air supply hose having one end connected to the second communicating slender pipe means and an opposite end connected to the change-over control means, and

a short pipe extending from one end of the first communicating slender pipe means of the closing stopper to open facing an inner wall bottom part of the ballast exhaust pipe,

whereby, when the outward opening must be closed, compressed air is supplied to said air supply hose by the operation of the change-over means and, by raising the air pressure in the ballast exhaust pipe through the second communicating slender pipe means, and any fluid which





has leaked in the ballast exhaust pipe is drawn out by the short pipe into the first communicating slender pipe means for passage to the second feed and exhaust hose.

4,550,752

METHOD FOR CONVEYING A FLEXIBLE THREAD BY MEANS OF PRESSURIZED GAS

Petrus G. J. Manders, Eindhoven, Netherlands, assignor to Ruti-te Strake B.V., Netherlands

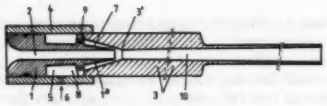
PCT No. PCT/NL81/00026, § 371 Date Jun. 29, 1982, § 102(e) Date Jun. 29, 1982, PCT Pub. No. WO82/01728, PCT Pub. Date May 27, 1982

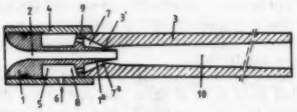
PCT Filed Nov. 13, 1981, Ser. No. 394,936

Claims priority, application Netherlands, Nov. 17, 1980, 8006265; Nov. 17, 1980, 8006264; Dec. 31, 1980, 8007127

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—435 **3 Claims**





1. An injector for conveying a flexible thread by means of a subsonic flow of pressurized gas for inserting a weft thread into the weaving shed of a weaving machine, comprising an inlet element provided with a chamber connected to a source of pressurized gas, a first channel extending from said chamber

for a primary gas flow, a central channel provided in said inlet element in which the thread to be conveyed is supplied together with a secondary air flow, a second channel merging with said first channel, a mixing tube in an abutting relationship with a said inlet element and defining a third channel of circular cross-section therein, said third channel combining said primary gas flow and said secondary air flow into a single gas flow taking along the thread to be conveyed, said third channel defining a restriction downstream of the merger of said second channel with said first channel, an end portion of said inlet element terminating upstream of said restriction, said restriction followed by a predetermined increase in cross-section of said third channel, wherein the third channel has, as seen in the conveying direction, a gradually increasing cross-section between a conical angle of a fraction of one degree and one degree, the circular cross-section of the third channel deformed at an exit end portion of the third channel so as to narrow the cross-section at the exit in at least one direction while maintaining said gradually increasing cross-sectional area at the exit end.

4,550,753

WEFT TRANSFER CONTROL SYSTEM IN AN AIR JET LOOM

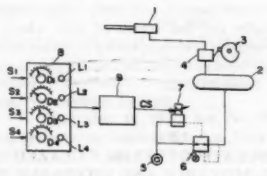
Kanji Tsuji, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan

Filed Dec. 14, 1983, Ser. No. 561,465

Claims priority, application Japan, Dec. 14, 1982, 57-189496[U]

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—435 **3 Claims**



1. A weft transfer control system for an air jet loom having a main nozzle and a plurality of weft supply members, the end of the weft released from one weft supply member being connected to the beginning of the weft released from the adjacent weft supply member, the air jet loom capable of continuously releasing the weft from said weft supply members, said system comprising:

means for detecting that the release of the weft is being transferred from one weft supply member to another adjacent weft supply member and for generating a transfer signal corresponding to the adjacent weft supply member;

a control box, connected to said detecting means, for presetting a plurality of initial supply pressures for the main nozzle, respectively corresponding to the weft supply members, said control box generating a control signal corresponding to the one of the plurality of preset initial supply pressures corresponding to the transfer signal generated by said detecting means;

nozzle pressure adjusting means for adjusting the supply pressure to the main nozzle to the one of the initial supply pressures in dependence upon the control signal generated by said control box; and

delay means for delaying the adjusting operation of said nozzle pressure adjusting means for a predetermined time after said detecting means generates the transfer signal.

4,550,754

WEFT PICKING SYSTEM OF LOOM AND METHOD FOR OPERATING SAME

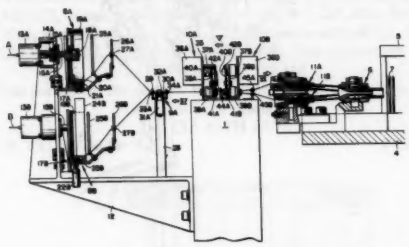
Hideo Iida, Hachioji, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 11, 1984, Ser. No. 619,197

Claims priority, application Japan, Jun. 29, 1983, 58-116168; Jun. 29, 1983, 58-116171

Int. Cl.⁴ D03D *47/36*

U.S. Cl. 139—452 **22 Claims**



1. A method of operating a weft picking system of a loom, of the type wherein a weft yarn is wound around a stationarily maintained drum by a weft winding-guide member rotated a predetermined number of times to measure out a length of the weft yarn to be picked through a weft inserting nozzle, said method comprising:

driving said weft winding-guide member by a pulse motor having a variable revolution speed;

slowly decreasing the revolution speed of said pulse motor from a predetermined level until said pulse motor stops so as to measure out a predetermined portion of a weft length to be required for one pick of the weft yarn by a point in time at which said pulse motor stops; and

slowly increasing the revolution speed of said pulse motor to said predetermined level from an initiation of revolution of said pulse motor so as to measure out a remaining portion of said weft length by a point in time at which weft picking terminates.

4,550,755

VACUUM BAG FILLER

Edric W. Vredenburg, Sr., 2690 Milo Way, Salt Lake City, Utah 84117

Filed Jun. 24, 1983, Ser. No. 507,476

Int. Cl.⁴ B65B *1/28*

U.S. Cl. 141—59 **3 Claims**

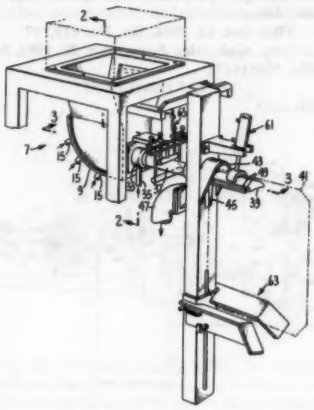
1. A bag filling machine for packing a finely divided particulate material into a bag, comprising in combination:

(a) a hopper for receiving a supply of said material,

(b) said hopper having at least some porous walls and means for directing air through said walls to fluidize said material along the walls, leaving the main body substantially not fluidized of said material,

(c) an outlet near the bottom of said hopper leading to a discharge nozzle,

(d) means for blasting air into said discharge at the bottom of said hopper adjacent the nozzle, and



(e) vacuum means at least partially surrounding said discharge nozzle.

4,550,756

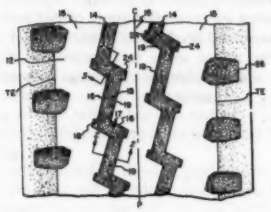
PNEUMATIC TIRE TREAD

Walter W. Hinkel, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 16, 1984, Ser. No. 571,394

Int. Cl.[4] B60C *11/04*

U.S. Cl. 152—209 R **17 Claims**



1. A radial tire having a ground-engaging tread portion, said tread portion comprising at least two circumferentially extending grooves which have a substantially constant width, each groove comprising a plurality of alternating zig-zag segments, each segment having a pair of oppositely disposed sidewalls, one sidewall comprising a first portion extending from substantially the base of the groove radially outwardly in a substantially perpendicular direction with respect to a line tangent to the tread surface, a second portion extending from the radially outer end of said first portion radially outward to the tread surface, and being inclined at a first angle with respect to a line perpendicular to the tread surface, said first portion having a height no greater than approximately 50% of the depth of said groove, said second sidewall extending from substantially the base of the groove radially outwardly to the surface of the tread and being inclined at a second angle with respect to a line perpendicular to the tread surface, and said second sidewall and said second portion of the first sidewall forming an included angle of at least 30°, said first angle of said second portion of said first sidewall being at least 10° greater than said second angle of said second sidewall, and wherein said first and second angles are substantially constant in each segment.

4,550,757

TRACTION CHAIN FOR A DRIVEN WHEEL OF A WHEELED VEHICLE

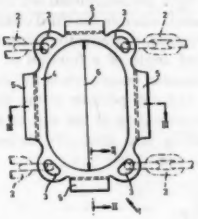
Rütger Berchem, Essen-Schuir, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,951

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239099

Int. Cl.[4] B60C *27/20*

U.S. Cl. 152—228 **4 Claims**



1. A traction chain for a pneumatic tire wheel of a wheeled vehicle comprising at least one die-forged one piece traction element in the form of a flat unitary ring-shaped generally oval body having a long axis corresponding substantially to the width of a tire to which the chain is to be applied and provided at four diametrically opposite locations spaced apart from one another with respective eyes, and link means engageable in said eyes to incorporate said element in said chain, said body being formed between said eyes unitarily with ribs projecting codirectionally from said body, said ribs including ribs transverse to the direction of travel of the wheel and ribs parallel to the direction of travel thereof, said body being dimensioned to extend substantially the full width of said wheel, said ribs having a wedge-shaped self-sharpening cross section whereby each rib is defined between a pair of outwardly concave mutually converging curved flanks.

4,550,758

EXTERIOR INSULATING FLEXIBLE GLAZED SURFACE COVERING, MOVABLE AND STOWABLE FROM INDOORS

Carter F. Johnson; Cheryl L. Larson, both of 3868 Miller Trunk Hwy., Duluth, Minn. 55811, and Judy M. Tepley, P.O. Box 7203, Duluth, Minn. 55807

Filed Sep. 9, 1983, Ser. No. 530,503

Int. Cl.[4] A47H *3/00*; E06B *9/17*

U.S. Cl. 160—271 **6 Claims**

1. Exteriorly mounted window covering apparatus comprising:

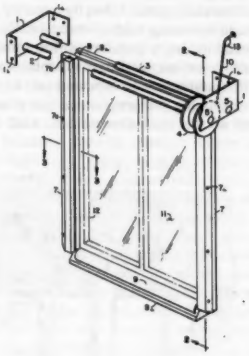
a nontransparent window covering member including first and second layers of a weather resistant ultraviolet impermeable material mounted in surrounding relation to an insulative layer having a relatively large R rating and wherein the peripheral edges of said first and second layers are sealed to one another with two opposed edges each including a lengthwise extending beal-like portion of a thickness greater than the combined thickness of said first and said layers, said window covering further including a weighted member mounted along one peripheral edge orthogonal to said bead including edges:

means mountable to a window for storing and guiding said covering member in relation to said window and wherein said covering member is rotatively coupled to a first roller and rotatively supported by a second roller such that said covering can be furled around and released from said first roller as desired;

means mounted to opposed sides of said window in tangential relation to said second roller for receiving said bead-

like edges of said window covering in sliding relation thereto;

first seal means mounted to said window orthogonally of the path of travel of said window covering at one end of said slide means in overlapping wiping relation to said window covering so as to contact the back of said window covering as it passes over said second roller; and



second seal means mounted to said window at the end of said guide means opposite said first seal means for compressively mating with said weighted member upon extending said window covering in covering relation to said window, said slide means and said first and second seal means thereby forming a substantially airtight space between said window covering and the glazed surface of said window.

4,550,759

APPARATUS FOR SIMULTANEOUSLY CLOSING AND OPENING A GROUP OF BLINDS

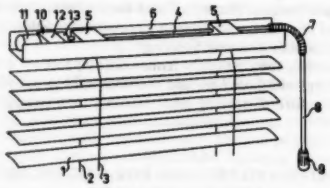
John Archer, Nynäshamn, Sweden, assignor to Ambient Energy Design, Nynäshamn, Sweden

Filed May 16, 1983, Ser. No. 495,276

Claims priority, application Sweden, May 20, 1982, 8203173

Int. Cl.[4] E06B *9/26*

U.S. Cl. 160—176 R **7 Claims**



1. An apparatus for simultaneously closing and opening a group of blinds each consisting of a number of thin slats which are suspended by means of vertical cords from at least one horizontal axis of rotation disposed above the slats, rotation of said axis being operable via the vertical cords to turnably adjust said slats between a substantially horizontal open position and a substantially vertical closed position, said axis being connected to a hand-operated mechanism for individual adjustment of the slats in each blind, an individual drive means for each of said blinds, each of said drive means being connected to said axis of rotation, each of said drive means being provided with means for limiting the torque exerted on said drive means when said hand-operated mechanism is operated to manually adjust the position of the slats, and a timing device connected to all of said drive means in the group of blinds for automatic energization of said drive means at predetermined points of time and for a preset time interval to set the slats in all blinds in the group to their closed or open positions irrespective of their then existing positions previously set by said hand-operated mechanisms.

4,550,760

TRANSPARENT ACCESS CURTAIN FOR COOLERS AND THE LIKE

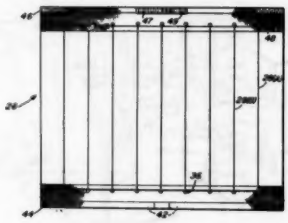
Kenneth N. Gidge, Nashua, N.H., and Henry J. Richard, Lowell, Mass., assignors to BSL Corporation, Nashua, N.H.

Continuation of Ser. No. 494,499, May 18, 1983, Pat. No. 4,420,027, which is a continuation of Ser. No. 287,303, Jul. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 93,193, Nov. 13, 1979, Pat. No. 4,313,485. This application Dec. 5, 1983, Ser. No. 558,118

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.[4] A47H *23/01*

U.S. Cl. 160—328 **8 Claims**



1. An access curtain for use over the opening of a display refrigerator or similar apparatus, comprising:

a body member formed of flexible material having slit-like apertures disposed between substantially parallel strip-like portions of the body member, the strip-like portions being disposed relative to each other in substantially abutting edge-wise relationship;

a pair of strips formed of reinforcing material, one strip being joined to an upper portion of the body member and the other strip being joined to a lower portion of the body member; and,

means carried by at least a portion of the curtain along an upper edge thereof for connecting the curtain to the refrigerator in proximity to the upper edge of said opening, the access curtain being dimensioned to span and cover the opening.

4,550,761

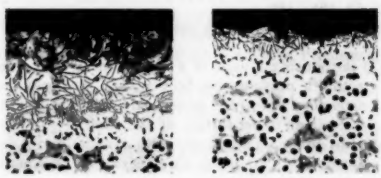
MOLD COATING

William H. Moore, Whitehall Apts.-6E, Whitehall Rd., Chattanooga, Tenn. 37405

Filed Nov. 3, 1982, Ser. No. 438,779

Int. Cl.[4] B22C *1/04*

U.S. Cl. 164—14 **5 Claims**



1. A method of avoiding sulphur contamination of a nodular

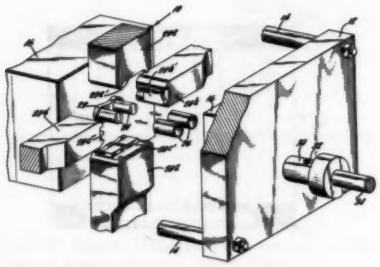
iron casting derived from a sand foundry mold containing sulphur bearing binders, said method comprising applying a wash to said sand foundry mold prior to making said casting, said wash containing an oxide or chloride of barium that will combine with sulphurous gases emitted from the sand foundry mold during casting, to form a solid sulphur compound, and said oxide or chloride of barium acting to protect nodular graphite in said casting from deterioration.

4,550,762

DIE CASTING PROCESS USING DISPOSABLE INSERTS DURING WARM UP

James C. West, Libertyville, and Elmer G. Gesell, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 21, 1983, Ser. No. 544,011
Int. Cl.⁴ B22D *19/00, 17/20*
U.S. Cl. 164—98 **8 Claims**



1. In a die casting process comprising the sequential steps of:
opening a pair of opposed die halves;
positioning a metallic insert in one of said die halves;
closing said die halves to form a die cavity containing said insert;
injecting molten metal into said die cavity to form a casting incorporating said insert as an integral part thereof;
opening said die halves; and
ejecting the casting from said die halves; and
wherein a series of warm-up casting cycles are initially required to bring the die halves to the correct casting temperature;
the improvement comprising substituting a non-metallic insert of inexpensive material for said metallic insert during the warm-up casting cycles.

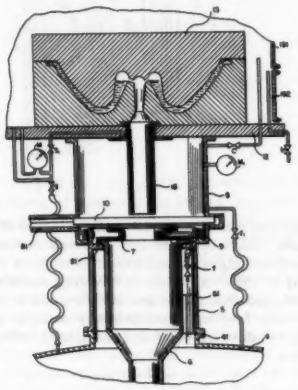
4,550,763

METHOD AND MACHINE FOR PRESSURE DIECASTING

Ivan D. Nikolov, Sofia, Bulgaria, assignor to Institute po Metaloznanie I Technologia na Metalite, Sofia, Bulgaria

Filed Dec. 2, 1981, Ser. No. 326,479
Claims priority, application Bulgaria, Dec. 11, 1980, 49948
Int. Cl.⁴ B22D *17/06*
U.S. Cl. 164—119 **7 Claims**

1. A pressure die casting method which comprises the steps of:
(a) introducing a melt of a molten metal into a reservoir within a pressurizable housing and having a feed tube extending upwardly from said melt and downwardly through an upper surface of said melt;
(b) providing a casting die with a mold cavity having a downwardly extending die tube adapted to communicate with said feed tube;
(c) initially blocking communication between said tubes at least in part by axially separating same and closing the top of said feed tube by sliding a plate across the top of the feed tube and across the bottom of a chamber in which said die tube is disposed;
(d) thereafter pressurizing said housing with a pressurized gas phase and communicating said pressurized gas phase to said feed tube above the melt therein to generate a superatmospheric pressure above the melt in said reservoir and feed tube, said pressure being above a pressure in said die;
(e) then interconnecting said tubes by opening the top of said feed tube and lowering said die tube axially into said feed tube and establishing a pressure differential between said die and said reservoir tending to displace melt from said reservoir through said feed tube and said die tube into said die while displacing the pressurized gas phase of said feed tube ahead of the melt therein into said die, said melt



filling said cavity, and said chamber being in gas communication with said housing during the displacement of the melt into said cavity;
(f) subsequently to the filling of said cavity with said melt, equalizing pressure between the upper portion of said feed tube and said housing, thereby permitting melt in said feed tube to recede to said reservoir;
(g) thereafter closing communication between said tubes by withdrawing said die tube from said feed tube and sliding said plate across the top of said feed tube and the bottom of said chamber, and closing gas communication between said chamber and said housing;
(h) removing the cast body from said die; and
(i) flushing said cavity in said die with said pressurized gas phase before displacing said melt into said cavity.

4,550,764

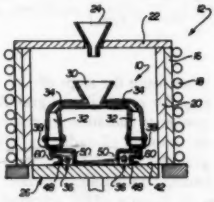
APPARATUS AND METHOD FOR CASTING SINGLE CRYSTAL ARTICLES

Robert A. Horton, Chesterland, and Gowri S. Jayaraman, Cleveland Heights, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 22, 1983, Ser. No. 564,299
Int. Cl.⁴ B22D *27/04*
U.S. Cl. 164—122.2 **15 Claims**

1. An apparatus for use in casting a doubly-oriented single crystal article in a mold cavity, said apparatus comprising a chill plate having an upper side surface, primary growth passage means extending upwardly away from said upper side surface of said chill plate for receiving molten metal during casting of the article, said primary growth passage means having an upper end portion offset to one side of said mold cavity and a lower end portion exposed to the upper side surface of said chill plate to promote the growth of metal crystals most favorably oriented for growth in an upward

direction at a rate which is greater than the growth rate of less favorably oriented crystals to enable the more favorably oriented crystals to retard the growth of the less favorably oriented crystals during solidification of the molten metal in said primary growth passage means, gradient inducing growth passage means extending upwardly away from the upper side surface of said chill plate for receiving molten metal during casting of the article, said gradient inducing growth passage means having a lower end portion exposed to the upper side surface of said chill plate and an upper end portion connected with the upper end portion of said primary growth passage means to promote the growth in said gradient inducing growth passage means of metal crystals simultaneously with the growth of metal crystals in said primary growth passage means and to promote the transmission of heat from the upper end portion of said primary growth passage means to said chill plate after solidification of metal crystals in said gradient inducing growth passage means, and secondary growth passage means for receiving molten metal during casting of the article, said secondary growth passage means extending sidewardly from the upper end portion of said primary growth passage means in a direction transverse to the direction of crystal growth in said primary growth passage means, said secondary growth passage means having a first end portion connected with the mold cavity and a second end portion connected with the upper end portions of said primary and gradient inducing growth passage means to promote the growth in said secondary growth passage means of metal crystals which are most favorably oriented for growth in a direction toward said first end portion of said secondary growth passage means at a rate



which is greater than the growth rate of less favorably oriented crystals under the influence of a heat gradient which is at least partially the result of a flow of heat from said secondary growth passage means to said chill plate through said gradient inducing passage means.

10. A method of casting an article comprising the steps of providing a mold having a cavity with a configuration corresponding to the configuration of an article to be cast, a secondary growth passage connected in communication with the mold cavity, a primary growth passage having an upper end portion connected with the secondary growth passage and an open lower end portion, and a gradient inducing growth passage having an upper end portion connected with the upper end portion of the primary growth passage and an open lower end portion, supporting the mold with a chill plate, said step of supporting the mold including positioning the mold with the open lower end portions of the primary and gradient inducing growth passages opening downwardly and with the upper end portions of the primary and gradient inducing growth passages disposed at the same vertical distance from an upper side surface of the chill plate, filling the mold cavity, and the primary, secondary and gradient inducing growth passages with molten metal, growing metal crystals upwardly in the primary and gradient inducing growth passages, reaching the upper end portions of the primary and gradient inducing growth passages with the upper end portions of the metal crystals, growing crystals away from the upper end portion of the primary growth passage into the secondary growth passage toward the mold cavity, and, while performing said step of growing crystals into the secondary growth passage, conducting heat from the upper end portion of the primary growth passage to the chill plate along a first path extending downwardly to the chill plate through the primary growth passage and along a second path extending downwardly to the chill plate through the gradient inducing growth passage to thereby promote the growth of crystals in the secondary growth passage.

4,550,765

APPARATUS FOR COMPACTING GRANULAR MOLDING MATERIALS

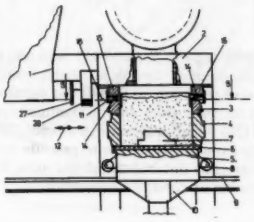
Kurt Fischer, Schaffhausen, and Franz Muller, Neuhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Nov. 14, 1983, Ser. No. 551,257

Claims priority, application Switzerland, Nov. 15, 1982, 6634/82

Int. Cl.⁴ B22C *15/00*

U.S. Cl. 164—194 **18 Claims**



1. An apparatus for compacting granular molding materials, particularly foundry molding material, comprising:

a molding unit movable in a first direction;

filling means for supplying molding material into said molding unit;

compression means for compacting the molding material in said molding unit; and

coupling means, at an outlet of said compression means, for forming a closed system between said compression means and said molding unit, said coupling means including a sealing surface and first and second pairs of opposed sealing strips engaging said sealing surface, said first pair of sealing strips extending substantially parallel to said first direction and having relatively broad and substantially planar contact surfaces oriented substantially parallel to said sealing surface for transmitting forces between said compression means and said molding unit when said contact surfaces engage said sealing surface, said second pair of sealing strips extending substantially perpendicular to said first direction and having relatively sharp, projecting edges formed by an apex of an angle between sides of each of said sealing strips of said second pair for contacting said sealing surface and repelling molding material from said sealing surface.

4,550,766

ROLL CASTER APPARATUS HAVING NOZZLE TIP ASSEMBLY WITH NOVEL SPACER MEMBER

Daniel K. Ai, New Kensington, and Ho Yu, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 9, 1984, Ser. No. 597,835

Int. Cl.⁴ B22D *11/06, 11/10*

U.S. Cl. 164—428 **10 Claims**

10. An improved roll caster tip apparatus having improved uniformity of metal flow velocity for casting wide strips of metal comprising:

(a) a reservoir for molten metal comprising a bottom plate and at least one sidewall; and

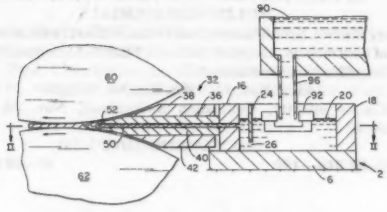
(b) a tip member attached to said sidewall and terminating in

an exit port spaced from said reservoir, said tip member comprising:

(i) a top wall and a bottom wall;

(ii) a pair of side risers members between said top wall and said bottom wall to form a passageway with said top and bottom walls; and

(iii) at least one spacer member between said top wall and said bottom wall spaced from said side riser members to



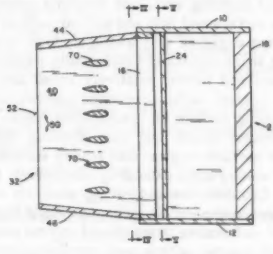
provide support for said top wall and bottom wall, said spacer member having a curved leading edge (72) facing said reservoir to permit the metal flow to smoothly pass on both sides and streamlined trailing edges (74) and (76) which terminate in a point (78) in the direction away from said reservoir to provide a streamlined shape to minimize disturbance to the main flow of metal and minimize or eliminate separation.

4,550,767

ROLL CASTER APPARATUS HAVING UNIFORM FLOW OF MOLTEN METAL INTO NOVEL NOZZLE TIP ASSEMBLY

Ho Yu, Murrysville, and Daniel K. Ai, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 9, 1984, Ser. No. 597,912
Int. Cl.[4] B22D *11/06, 11/10*
U.S. Cl. 164—428 **4 Claims**



1. An improved roll tip caster assembly for casting wide strips of metal comprising a molten metal reservoir comprising:

(a) a sidewall terminating in a bottom plate;

(b) a nozzle tip member attached to said sidewall having a top wall, a bottom wall and a pair of converging side riser members between the top wall and the bottom wall forming a converging passageway terminating in an exit port for molten metal to flow from the reservoir to a pair of rollers;

(c) an opening in said sidewall extending along the entire width of said nozzle tip member; and

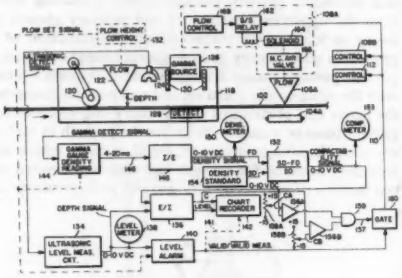
(d) a baffle member in said reservoir extending across the entire width of said sidewall opening and extending down from the top of said reservoir to a point just above said bottom plate, thereby providing a shielding from any turbulence created in said reservoir as well as providing a uniform friction for the metal flowing from said reservoir into said nozzle tip whereby metal flowing into said tip member from said reservoir has a uniform velocity across the entire width of said nozzle and said converging side risers maintain said uniform metal velocity as said molten metal flows through said nozzle to said rollers.

4,550,768

COMPACTABILITY MEASUREMENT METHOD AND APPARATUS FOR SAND CASTING

Carl R. McMullen, Waverly, and Marshall S. Campbell, Chattanooga, both of Tenn., assignors to Foundry Technology, Inc., Waverly, Tenn.

Filed Feb. 28, 1983, Ser. No. 470,566
Int. Cl.[4] B22C *25/00;* **B22D** *46/00, 47/02*
U.S. Cl. 164—456 **28 Claims**



10. A method comprising the steps of:

(a) subjecting granular material in a granular material casting foundry system to radiation from a radiation source,

(b) detecting an amount of radiation which has passed through the granular material from the radiation source,

(c) using the detected radiation to derive a density signal dependent on the density of the granular material, and

(d) operating on the density signal with a reference density value to derive a compactability signal dependent on the conpactability of the granular material, and

wherein the granular material is subjected to the radiation as it is moving from a mixer to at least one molding machine and the steps (a), (b), and (c) are performed in non-batch fashion, and wherein the granular material is subjected to the radiation as it is moving on a conveyor belt, and further comprising, before the granular material is subjected to the radiation, the steps of:

placing the granular material on the conveyor belt,

plowing the granular material to a level at or below a particular depth,

detecting the depth after the plowing, and

generating a depth signal depending on the detected depth.

26. A compactability measurement system for use with a granular material casting foundry system, the compactability measurement system comprising:

(a) a density detector for detecting in a non-batch fashion the density of granular material as it is moving from a mixer to at least one molding machine of the foundry system,

(b) a density signal generator connected to said density detector for generating a density signal dependent on the detected density, and

(c) a compactability signal generator connected to receive said density signal generator for generating a compactability signal dependent on said density signal and a reference density value, and

wherein said density detector comprises a radiation source and a radiation detector for detecting radiation which has passed through the granular material, and wherein said density detec-

tor detects density of the granular material as it moves on a conveyor belt and the system further comprises:

a plow upstream from said density detector for plowing the granular material to a level at or below a particular depth,

a depth detector between said plow and density detector for detecting the depth of said granular material, and

a depth signal generator for generating a depth signal on the detected depth.

4,550,769

SOLIDS QUENCH BOILER AND PROCESS

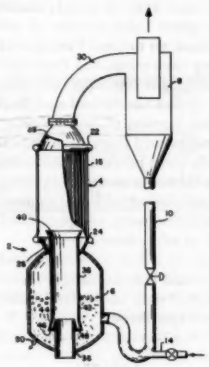
Arju H. Bhojwani, Chelmsford, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Continuation of Ser. No. 82,162, Oct. 5, 1979, Pat. No. 4,351,275. This application May 7, 1982, Ser. No. 375,730

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.[4] F28D *19/02*

U.S. Cl. 165—1 **9 Claims**



1. A process for quenching reactor effluent in first and second quenching zones comprising the steps of:

a. passing the effluent from the reactor outlet directly into a quench riser located in the first quenching zone, which quench riser is aligned with the reactor outlet tube;

b. introducing particulate solids of a lower temperature than the effluent into the effluent stream in the quench riser to partially quench the effluent; and, thereafter,

c. passing the composite stream of partially quenched effluent and particulate solids into the second quenching zone in indirect heat exchange relationship with a coolant to further quench the composite stream of effluent and particulate solids;

d. separating the quenched gas from the particulate solids after the effluent and particulate solids have passed in indirect heat exchange relationship with the coolant; and

e. returning the separated particulate solids for reintroduction to the effluent stream leaving the reactor.

4,550,770

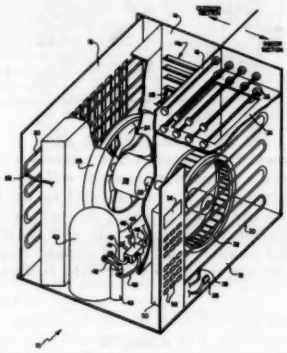
REVERSE CYCLE ROOM AIR CONDITIONER WITH AUXILLIARY HEAT ACTUATED AT LOW AND HIGH OUTDOOR TEMPERATURES

William R. Nussdorfer, Greenville; Harry A. Brancheau, Gowen, and Steven C. Clark, Grand Rapids, all of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Oct. 4, 1983, Ser. No. 538,943

Int. Cl.[3] F25B *29/00*

U.S. Cl. 165—29 **14 Claims**



1. A self-contained room air conditioner for heating or cooling air within a room to maintain a predetermined indoor room temperature over a wide range of outdoor ambient temperatures comprising:

a refrigerant compressor, an inside heat exchange coil, an outside heat exchange coil, and a reversing valve, said compressor, coils, and valve being interconnected to provide a reverse cycle refrigeration system having a cooling mode of operation wherein heat is extracted from the room air via said inside coil, and having a heat pump mode of operation wherein heat is provided to the room air via said inside coil, said reverse cycle refrigeration system when in said heat pump mode being operable only over a limited range of outdoor ambient temperatures within said wide range of outdoor ambient temperatures; and

heating element means of the electrical resistance type for automatically providing heat to said room air when said outdoor ambient temperature is greater than the upper limit of said limited range of outdoor ambient temperatures, and said predetermined indoor room temperature is to be maintained above said outdoor ambient temperature greater than said upper limit.

4,550,771

WASTE WATER HEAT RECOVERY APPARATUS

Morteza Arbabian, P.O. Box 1270, Madison, Wis. 53701

Division of Ser. No. 401,115, Jul. 23, 1982, Pat. No. 4,454,911, which is a division of Ser. No. 203,718, Nov. 11, 1980, Pat. No. 4,341,263. This application Jun. 18, 1984, Ser. No. 621,525

Int. Cl.[4] F28D *15/00*

U.S. Cl. 165—47 **2 Claims**

1. A heat exchanger adapted for the recovery of heat contained in waste water, comprising:

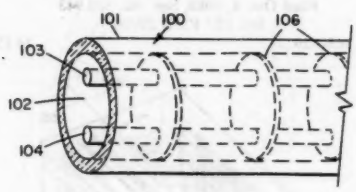
(a) an outer tube formed of heat insulating material and having an inner bore which is filled with heat transfer liquid having a high heat capacity;

(b) a waste water conduit running through the bore of the tube from an inlet end to an outlet end;

(c) a supply water conduit running through the bore of the tube from an inlet at the outlet end of the waste water

conduit to an outlet at the inlet end of the waste water conduit;

(d) a plurality of baffle plates mounted within the bore of the tube in spaced relation to divide it into a plurality of individual compartments each containing heat transfer liquid separated from the heat transfer liquid in adjacent compartments, the baffle plates further mounting the



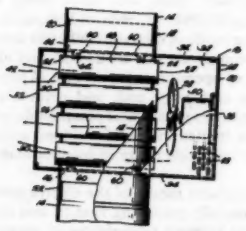
waste water and supply water conduits within the tube, whereby a temperature gradient will exist between the compartments in the tube divided by the baffles when warm waste water is passed through the waste water conduit from its inlet to its outlet with the temperature of the heat transfer liquid in the compartments decreasing from the inlet end of the waste water conduit to the outlet end.

4,550,772

HEAT RECOVERY DEVICE FOR EXHAUST FLUES

Darrell G. Knoch, C/O Miracle Heat, Inc. P.O. Box 553, Escanaba, Mich. 49829

Filed Mar. 31, 1983, Ser. No. 480,854
Int. Cl.⁴ F28D *7/02*
U.S. Cl. 165—47 **9 Claims**



1. A device for recovering and recirculating heat normally lost from the exhaust flues of a stove, furnace or the like, having a cylindrical flue said device including

a section of cylindrical flue pipe which has opposite ends adapted for connection to the existing cylindrical flue, which has an inside diameter substantially the same as that of the existing flue and through which the hot flue gases flow;

a plurality of hollow heating tubes extending diametrically through said flue pipe section so that the hot flue gases flow over the outer surfaces thereof, said heating tubes having opposite air inlet and discharge ends and being disposed in a single axially extending row;

a housing defining an air flow chamber completely surrounding the portion of said flue pipe section containing said heating tubes, said housing having an ambient air inlet on the same side of said flue pipe section as the inlet ends of said heating tubes and a heated air outlet on the same side of said flue pipe section as the discharge ends of said heating tubes; and

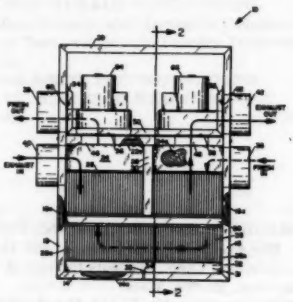
fan means inside said housing for drawing ambient air into said housing through said air inlet and propelling a flow of air toward said heated air outlet, both through said heating tubes and over the outer surface of the portion of said flue pipe section inside said housing.

4,550,773

HEAT EXCHANGER

Gerald L. Martin, Minneapolis, Minn., assignor to EER Products Inc., Minneapolis, Minn.

Filed Feb. 2, 1984, Ser. No. 576,352
Int. Cl.⁴ F24H *3/02*
U.S. Cl. 165—54 **2 Claims**



1. Heat exchanger comprising;

a. means for side-by-side laminar straight-thru non-turbulent air flow with counter flow heat transfer and exchange;

b. means for housing said heat transfer means in a lower two third portion and fresh air supply means and exhaust air means in an upper third portion of said housing means including exhaust air out and fresh air out ducts symmetrically opposing each other, and fresh air in and exhaust air ducts in diametrically opposing each other in said housing means, said exhaust air out and said fresh air out ducts in an upper third portion of said housing means and connected to blowers, said fresh air in and exhaust air in ducts are in a middle third portion of said cabinet, said blowers mount on a slideable tray also in an upper third portion of said cabinet and aligned with said exhaust air out holes and air passage holes between an upper third and said middle third portion of said cabinet; and,

c. divider means in a lower third of said housing means extending into said heat exchanger means for providing a lateral downward path an a lateral upward path through said heat exchanger means.

4,550,774

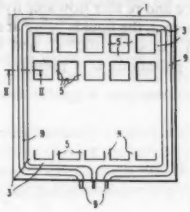
SURFACE HEATING BODY FOR VEHICLES

Rudolf Andres; Helmut Grantz, both of Sindelfingen; Wolf-Dietrich Muenzel, Ehningen, and Wolfgang Odebrecht, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,776
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203369
Int. Cl.⁴ F28D *15/00*
U.S. Cl. 165—104.21 **18 Claims**

11. A plate-shaped heater for the horizontal installation and use in a vehicle wherein the heater is developed as a multilayer inflated partially laminated piece, containing a hermetically sealed, connected heat pipe channel system extending over the surface of the plate-shaped heater, said heat pipe channel system being formed by crossing channels which extend at least in two directions at angles with respect to one another to a center and an outer edge respectively and are connected with one another, the heat pipe channel system containing a condensate collector channel contiguous only to one of said center and

outer edge and into which the crossing channels lead, the condensate collector channel being connected at least approxi-



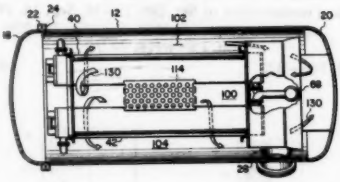
mately over its whole length in a heat-conducting manner with a heat source extending correspondingly at least approximately along the whole course of the condensate collector channel.

4,550,775

COMPRESSOR INTERCOOLER

John C. Edwards, Onalaska, Wis., and Russell A. Ford, Winona, Minn., assignors to American Standard Inc., New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,028
Int. Cl.[4] F28B *9/00*; F28F *9/22*
U.S. Cl. 165—111 **11 Claims**



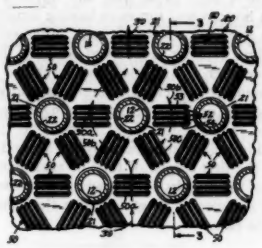
1. A compressor intercooler comprising a cylindrical shell having an inlet nozzle and an outlet nozzle therein; said inlet nozzle disposed in the upper middle portion of said shell to discharge downward into the central area of the interior of said shell; first and second vertical coil banks disposed longitudinally in said shell, said coil banks being spaced from each other and spaced from the shell so that said inlet nozzle discharges downward between said first and said second coil banks; and baffle means for constraining a fluid entering said inlet nozzle to flow through said coil banks, said baffle means disposed between each of said first and said second coil banks and said shell, said baffle means cooperating with said first and said second coil banks to further constrain the flow of a fluid entering said intercooler through said inlet nozzle to be split and to change direction a first time prior to passing through said coil banks and to change direction at least a second time, subsequent to passing through said coil banks, said splitting of fluid flow and said first fluid direction change causing said fluid to pass horizontally through said first and second coil banks in equal portions and at a velocity substantially reduced from the inlet velocity of said fluid to minimize the carryover of liquid condensed from the fluid as the fluid passes through said coil banks, said second direction change for promoting the disentrainment of condensed liquid carried out of said coil banks by said fluid as said fluid passes through said coil banks.

4,550,776

INCLINED RADIALLY LOUVERED FIN HEAT EXCHANGER

James W. B. Lu, 5868 Oxford Dr., Greendale, Wis. 53129

Filed May 24, 1983, Ser. No. 497,661
Int. Cl.[4] F28F *1/32*
U.S. Cl. 165—151 **1 Claim**



1. A tube fin heat exchanger assembly, comprising:

a plurality of parallel, spaced round sectioned tubes extending transversely through holes provided in a plurality of generally planar, spaced parallel fins;

a plurality of louver groups on said fins extending radially from tubes toward adjacent tubes;

said louver groups comprising a plurality of parallel slits formed in said fins extending in a direction generally between adjacent tubes and defining elongate rectangular portions therebetween;

said elongate rectangular portions inclined with respect to the plane of said fin to extend one edge thereof above one side of the fin and the other edge thereof above the other side of the fin to form a group of inclined louvers; and

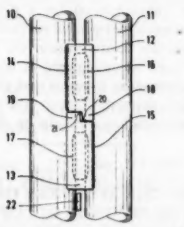
the direction of inclination of said louvers being opposite in alternating groups of said louvers which extend radially outward from each tube.

4,550,777

SYSTEM FOR INTERLOCKING CLOSELY AJACENT VERTICAL LENGTHS OF TUBE IN A HEAT EXCHANGER HAVING LOOPS

Jean Fournier; Henri Patron, both of Rochefort en Yvelines, and Paul Meynard, Verrieres le Buisson, all of France, assignors to Stein Industrie, France

Filed Nov. 19, 1984, Ser. No. 673,052
Claims priority, application France, Nov. 25, 1983, 83 18815
Int. Cl.[4] F28F *9/00*
U.S. Cl. 165—162 **2 Claims**



1. A system for interlocking closely adjacent vertical lengths of tubes in a heat exchanger in which each tube forms loops between an inlet length of tube and an outlet length of tube and in which tubes are suspended from a rigid structure by said inlet and outlet lengths of said tubes, said system comprising an upper hollow member and a lower hollow member located between each adjacent pair of lengths of tube, the upper hol-

low member being welded to a first length of tube in each adjacent pair and pressing laterally against the other or second length of tube in the pair, and the lower hollow member being welded to the second length of tube of the pair and pressing laterally against the first length of tube of the pair, the upper and lower hollow members having facing bottom and top ends, respectively, being located so as to come into end-to-end contact with each other and said upper and lower hollow members bottom and top ends having longitudinally overlapping lips projecting towards each other such that the lip of each hollow member is received between the lip of the other hollow member and the length of tube to which the other hollow member is welded, thereby laterally interlocking the lengths of tube of the pair, and enabling at least a portion of the weight of the first length of tube to be supported, via the interlocking hollow members, by the second length of tube of the pair, the first length of tube of each pair being chosen as that one of the lengths of tube which is further from the corresponding supporting length of tube than the other length of tube of the pair.

4,550,778

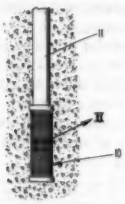
WELL SCREEN

Dale W. Sullivan, Wayne; Kermit W. Janssen, Valley Forge, both of Pa., and Andrew Mitchell, Pompano Beach, Fla., assignors to CertainTeed Corporation, Valley Forge, Pa.

Filed Jun. 20, 1983, Ser. No. 505,904

Int. Cl.[4] E21B *43/08*

U.S. Cl. 166—234 **6 Claims**



1. A well screen of generally hollow tubular configuration and comprised of at least one molded screen portion, such screen comprising a peripheral skin, rib means inwardly of the skin providing rigidifying support for the skin, said skin being of fluted construction defining a plurality of alternating longitudinal channels and longitudinal mounds on the outer peripheral surface thereof, and a plurality of longitudinally spaced slots in the skin, extending generally transverse to the axis of the tube, and creating openings through the skin, wherein said skin is further characterized by a plurality of longitudinal channels on the inner peripheral surface thereof, wherein said skin is of sawtooth configuration on both inner and outer peripheral surfaces when viewed in transverse cross-section, comprised of alternating mounds and channels on one surface complementarily aligned through the wall with alternating channels and mounds respectively on the opposite surface.

4,550,779

PROCESS FOR THE RECOVERY OF HYDROCARBONS FOR MINERAL OIL DEPOSITS

Bohdan M. Zakiewicz, 4521 E. 75th, Tulsa, Okla. 74136

Filed Mar. 6, 1984, Ser. No. 586,714

Claims priority, application United Kingdom, Sep. 8, 1983, 8306307

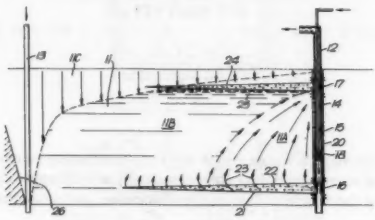
Int. Cl.[4] E21B *43/24, 43/267*

U.S. Cl. 166—248 **22 Claims**

1. A process for recovery of hydrocarbons from mineral oil deposits, comprising the steps of:

(a) establishing fluid communication between a subterranean oil bearing strata and a processing facility on the overlying surface;

(b) injecting mining liquids at an injection level into the strata to displace and render flowable hydrocarbon deposits contained therein, the liquids being at a temperature not substantially in excess of 100° C. and being injected in hydrodynamic pulsations at a pressure greater than the



ambient pressure of the strata, but insufficient to induce fracturing and undesirable channelling differential within the formation;

(c) collecting the mixture of mining liquids and flowable hydrocarbons at a collecting level and bringing the mixture to the processing facility; and

(d) hydrodynamically recycling the mining liquids.

4,550,780

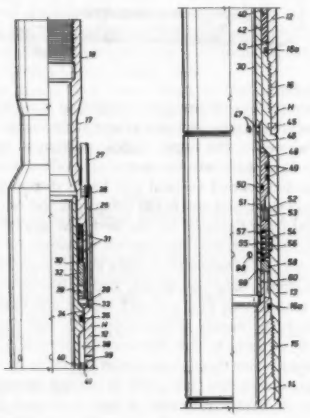
PRESSURE OPERATED SAFETY VALVE WITH LOCK MEANS

James D. Mott, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 256,194, May 23, 1972, abandoned, which is a continuation of Ser. No. 72,034, Sep. 14, 1970,. This application Apr. 30, 1981, Ser. No. 259,019

Int. Cl.[4] E21B *34/10*

U.S. Cl. 166—323 **39 Claims**



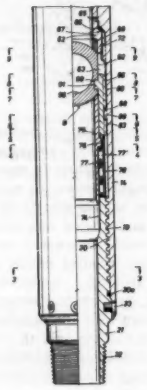
1. A safety valve for mounting in a well tubing at a subsurface location in a well, comprising:

a housing having a longitudinal bore therethrough and adapted to be connected at its upper and lower ends to a well tubing with said bore in alignment with the bore of the well tubing;

a valve disposed in the bore of said housing for movement to and from an open position for enabling upwardly flow in said bore and a closed positions for blocking upwardly flow through said bore;

valve actuator means disposed in said housing for imparting movement to said valve to move it to and from the open and closed positions for controlling upwardly flow in the bore of the well tubing in response to a remote control signal; and

lock means for mechanically locking said valve in the open position to prevent closing the valve for enabling repeated passages of well tools through said bore, said means for mechanically locking said valve selectively releasable to unlock said valve to enable closing of said valve to resume control of upwardly flow.



4,550,781

METHOD OF AND APPARATUS FOR CUTTING AND RECOVERING OF SUBMARINE SURFACE CASING

Edmond Kagler, Jr., Sugar Land, Tex., assignor to A-Z International Tool Company, Houston, Tex.

Filed Jun. 6, 1984, Ser. No. 617,746

Int. Cl.⁴ E21B *29/00*

U.S. Cl. 166—340 **12 Claims**

1. An apparatus for cutting and retrieving a submarine casing comprising:

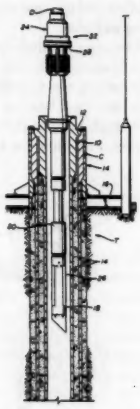
a lower casing cutter having cutting arms which can be urged outwardly to cut submarine casing while the cutter is rotated;

an integral anchor and swivel combination above the casing cutter mounted for movement between an anchored engaged position with the casing to restrain longitudinal movement relative to the casing, and a disengaged position to permit movement thereof relative to the casing, said integral anchor and swivel combination having a central bore therethrough and gripping elements for engaging the casing in a gripping relation;

a mandrel suspended from a drill string extending through said central bore in said anchor and swivel combination and mounted for rotation relative to said combination, said mandrel connected in drive relation to said casing cutter for rotating said cutter in cutting relation to said casing;

latching means between said mandrel and said anchor and swivel combination selectively movable between a latched position in which said mandrel and said anchor and swivel combination rotate together, and an unlatched position in which said mandrel rotates relative to said anchor and swivel combination and is permitted to move longitudinally relative to said combination; and

actuating means for said gripping elements mounted on said mandrel for longitudinal movement therewith and for relative rotational movement, said actuating means upon movement of said latching means to an unlatched position and raising of the mandrel moving said gripping elements into gripping relation with said casing and placing said mandrel and drill string in tension, and upon subsequent lowering of said mandrel and drill string releasing said gripping elements from gripping relation with said casing, said mandrel being mounted for rotation relative to said gripping elements and said actuating means in both the raised and lowered positions thereof.



4,550,782

METHOD AND APPARATUS FOR INDEPENDENT SUPPORT OF WELL PIPE HANGERS

John E. Lawson, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Dec. 6, 1982, Ser. No. 446,995

Int. Cl.⁴ F16L *21/00*; E21B *19/10*

U.S. Cl. 166—382 **14 Claims**

1. In a remotely installed underwater well installation capable of operating under conditions of high internal fluid pressure and of supporting long and heavy strings of well pipe, the combination of

a support member having

an elongated upright through bore,

a generally upwardly facing lower support, and

a transverse annular inwardly opening groove in a portion of the wall of the through bore which is of substantially uniform diameter, the groove being located above the

lower support and having a lower wall constituting a load-bearing shoulder;

first hanger means seated on the lower support of the support member and having a first string of pipe depending therefrom,

the load applied by the first hanger means under the weight of the first string of pipe being applied directly to the support member via the upwardly facing lower support;

second hanger means from which a second string of pipe depends, the second hanger means comprising

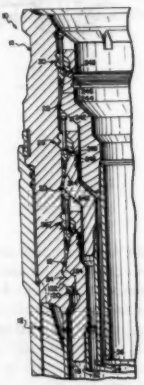
an annular load-bearing member having

a first lower surface portion,

a second lower surface portion disposed inwardly of the first lower surface portion and constituting a stop surface, and

an upwardly directed downwardly and inwardly tapering camming surface,

the annular load-bearing member being resiliently deformable between a first condition, in which the load-bearing member is relaxed and has an outer diameter sufficiently small to allow the load-bearing member to be passed through the through bore of the support member, and a second condition, in which the load-bearing member is



expanded to present an outer diameter substantially larger than the inner diameter of the load-bearing shoulder of the groove,

the load-bearing member being in its second condition and engaged in the groove with the first lower surface portion of the load-bearing member in flush engagement with the load-bearing shoulder of the groove, and

a camming member to which the weight of the second string of pipe is applied downwardly and which includes a downwardly and inwardly tapering camming surface engaged with the camming surface of the load-bearing member to maintain the load-bearing member engaged in the groove; and

upwardly projecting stop means which, at the time of lowering the second hanger means into the through bore of the support member, is located below the groove in a position to be engaged by the second lower surface portion of the annular load-bearing member to stop the annular load-bearing member so that downward movement of the camming member of the second hanger means cams the load-bearing member to its second condition;

the load applied by the second hanger means under the weight of the second string of pipe being applied directly to the support member via the lower wall of the groove.

4,550,783

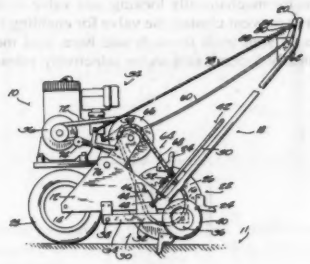
SELF-PROPELLED AERATING DEVICE

Loren F. Hansen, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 874,209, Feb. 1, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,277

Int. Cl.⁴ A01B *45/02*

U.S. Cl. 172—21 **9 Claims**



1. A self-propelled aerating device including a chassis having a handle, aerating means for penetrating the ground, an engine having an idle speed, a throttle operatively connected with said engine and movable between a normally idle position for operating said engine at said idle speed and an advanced position for operating said engine at above said idle speed, aerator drive means movable between a normally disengaged position for rendering said aerating means inoperative and an engaged position for drivingly connecting said operating means with said engine, and control means for moving said aerator drive means from said disengaged position to said engaged position before moving said throttle from said idle position to said advanced position and for moving said throttle from said advanced position to said idle position before moving said aerator drive means from said engaged position to said disengaged position, said control means including a control handle attached to said handle and movable between a neutral position and a drive position, a throttle control linkage operably connected between said throttle and said control handle for locating said throttle in the idle position when said control handle is in the neutral position and for locating said throttle in the advanced position when said control handle is in the drive position, and a control linkage operatively connected between said aerator drive means and said control handle for locating said aerator drive means in the disengaged position when said control handle is in the neutral position and for locating said aerator drive means in the engaged position when said control handle is in the drive position, and spring means for biasing said throttle control linkage toward said idle position, said control handle including an override bracket operatively connected with said throttle and attached to said spring means for moving said throttle from said idle position to said advanced position in response to movement of said control handle from said neutral to said drive position, and for moving said throttle from said advanced position to said idle position in response to said spring means.

4,550,784

TOOL MOUNTING MEANS FOR A HYDRAULICALLY POWERED IMPACT HAMMER

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037, and Bernard W. Duehr, Jr., 4525 Twain Ave., Apt. 17, San Diego, Calif. 92120

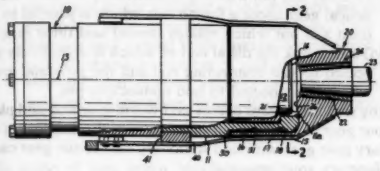
Filed Jan. 3, 1983, Ser. No. 455,213

Int. Cl.⁴ B25D *9/14*

U.S. Cl. 173—114 **5 Claims**

1. In combination with a hydraulically powered impact hammer of the type which has an axis and utilizes a hydraulically compressed gas charge to store energy, which energy is

abruptly released axially to drive the hammer for the purpose of axially driving a tool, said hammer and the means to drive it being mounted to a frame, said frame having a nose with an external peripheral axially-extending bearing surface, the improvement comprising: a tool mount adapted to hold said tool,



said mount having an internal axially-extending bearing surface, said bearing surfaces being in axial sliding embracing telescopic relationship with part of said mount extending around said nose, said mount being so disposed and arranged as to be struck by said hammer in order to drive said tool.

4,550,785

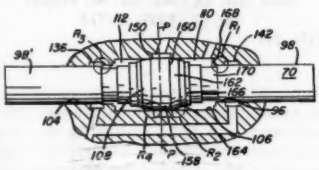
HAMMER

George A. Hibbard, Claremont, and Ward D. Morrison, South Acworth, both of N.H., assignors to Consolidated Technologies Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 680,823, Apr. 28, 1976,. This application May 29, 1979, Ser. No. 43,089

Int. Cl.⁴ B25D *9/00*

U.S. Cl. 173—134 **11 Claims**



1. A hydraulic drive for actuating a tool comprising: a body member having an elongated bore therein with a central longitudinal axis and with one end of said bore being adapted to receive at least a portion of an actuatable tool structure internally thereof; an elongated piston axially reciprocal within said bore to deliver impact blows to such a tool structure; said bore having an axially intermediate chamber section of greater cross-sectional extent than the cross-sectional extent of the adjacent sections of said bore axially outwardly thereof; said piston having a formed axially intermediate head section; said head section having axially extending outer peripheral surface closely slideably received within said chamber section to define chamber portions within said chamber section on axially opposite sides of said central portion of said head section which chamber portions vary inversely in volume as said piston reciprocates; first passageway means in said body member having axially spaced fluid inlet port means in communication with said bore axially outwardly of said chamber section, respectively, said piston having formed axially spaced means cooperable with said port means, respectively, for selective admission of hydraulic fluid to said chamber portions alternately; second passageway means in said body member having a discharge port means with an axial extent in communication with said chamber section; said outer peripheral surface having the axially spaced ends thereof cooperable with said axial extent of said discharge port means to control the discharge of hydraulic fluid from said chamber portions; said head section having formed portions extending axially outwardly from the ends of said axially extending outer peripheral surface respectively, and said formed portions being of a configuration to uniformly increase the flow of hydraulic fluid through said discharge port means and said second passageway means after an initiation of flow therethrough during reciprocation of said piston.

4,550,786

METHOD OF DRIVING STEEL PROFILES INTO A ROCK SUBSTRATUM

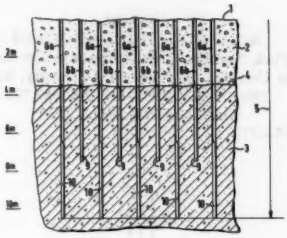
Winfried Rosenstock, Heyestrasse 28, 3063 Obernkirchen, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,710

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3248430

Int. Cl.⁴ E21B *43/11*

U.S. Cl. 175—2 **7 Claims**



1. A method of driving the lower ends of sheet piles into a rock substratum for the purpose of constructing a sheet pile wall, comprising the steps of boring boreholes in the rock substratum at predetermined intervals along the intended sheet pile wall, inserting at least one closed container containing an explosive charge into each borehole and disposing the containers in adjacent boreholes in at least two zones located at different depths, selecting a small volume of the explosive charge relative to the volume of the container, first detonating the explosive charges in at least two adjacent zones at one depth and then the explosive charges in at least two adjacent zones at a different depth to shatter the rock substratum in its internal structure but leave the substratum almost undamaged in its external form between the boreholes and subsequently driving sheet piles into the disintegrated rock substratum.

4,550,787

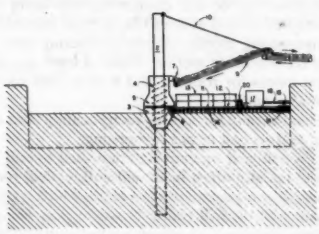
EARTH BORING MACHINE AND WORKING CRANE

Alexander Stefan, 4680 W. Russell Rd., Las Vegas, Nev. 89118

Filed Jul. 5, 1983, Ser. No. 510,746

Int. Cl.⁴ E21B *41/00*

U.S. Cl. 175—88 **7 Claims**



1. A machine assembly for, first, excavating a hole in the ground, and then constructing a structure therein, comprising, in combination, an earth boring machine, a working crane and a post mountable in the ground, for selectively mounting said earth boring machine or said working crane thereupon; said earth boring machine comprising a rotatable unit and a non-

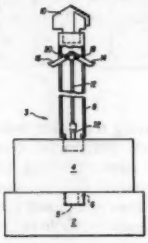
rotatable unit, said rotatable unit being under said non-rotatable unit; said rotatable unit including means to dig a circular ground surface around said post, and including means to raise upwardly loose earth taken from said hole; said rotatable unit comprising an upwardly flared lower sleeve surrounding a lower portion of a spiralled screw welded around a tubular collar through which said post extends, an opening on a side of said sleeve, a radially extending, horizontal chain frame secured at one end to said sleeve adjacent said sleeve opening, an endless chain rotated on said frame, and a plurality of earth-digging teeth along said chain, said chain frame being forwardly angled, and forming an acute corner at said sleeve opening, for aiding loosened, dug earth to enter said opening for being raised up said spiral screw.

4,550,788

ROOF BOLT HOLE GROOVER

Duk-Won Park, Northport, Ala., assignor to The Board of Trustees of the University of Alabama, University, Ala.

Filed Nov. 8, 1983, Ser. No. 549,736
Int. Cl.[4] E21B *10/32, 7/28*
U.S. Cl. 175—173 **17 Claims**



1. A drilling device for use in bolting together a discontinuous rock mass in order to provide a safe mine roof, said drilling device comprising:

(a) a hollow drill rod having a first axis;

(b) a drill bit mounted on the distal end of said hollow drill rod;

(c) at least two groove bits pivotally mounted in said hollow drill rod, the distal ends of said groove bits projecting through slots in said hollow drill rod over at least part of the pivotal motion of said groove bits and extending radially outwardly beyond the diameter of said drill bit, said at least two groove bits being shaped to score the surface of a hole drilled by said drill bit during use of the drilling device;

(d) a connecting rod disposed inside said hollow drill rod, the distal end of said connecting rod being operatively connected to said at least two groove bits such that axial reciprocating motion of said connecting rod causes pivotal reciprocating motion of said at least two groove bits;

(e) first means for rotating said hollow drill rod about said first axis; and

(f) second means for axially reciprocating said connecting rod, said second means comprising:

(i) a worm gear operatively connected to said first means and radially offset from said hollow drill rod such that said worm gear rotates in a circle which is concentric to said hollow drill rod, said worm gear being rotatable about a second axis which is parallel to said first axis but which rotates around said first axis;

(ii) a planetary spur gear operatively connected to said worm gear such that said planetary spur gear rotates about said second axis and such that the rotational motion of said planetary spur gear is transferred to said worm gear;

(iii) a stationary female sun gear which is concentric to said first axis and which meshes with said planetary spur gear;

(iv) a helical gear which meshes with said worm gear and which is mounted for rotation about a third axis which is perpendicular to said first axis;

(v) a conecting pin which is eccentrically mounted on said helical gear about a fourth axis which is parallel to said third axis but which rotates around said third axis; and

(vi) a first link the distal end of which is operatively connected to said connecting rod and the proximal end of which is connected to said connecting pin,

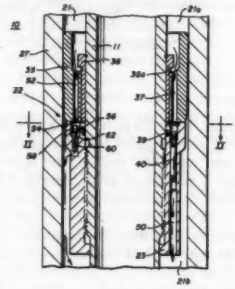
whereby said first means causes said worm gear and said planetary spur gear to rotate about said first axis, the meshing of said planetary spur gear with said stationary female sun gear causes said planetary spur gear and said worm gear to rotate about said second axis, the rotation of said worm gear about said second axis causes said helical gear to rotate about said third axis, the rotation of said helical gear about said third axis causes said connecting pin to rotate about said third axis, the rotation of said connecting pin about said third axis causes the distal end of said first link to reciprocate axially, the axial reciprocation of the distal end of said first link causes said connecting rod to reciprocate axially, and the axial reciprocation of said connecting rod causes said at least two groove bits to reciprocate pivotally, thereby scoring the surface of the holding drilled by said drill bit during use of the drilling device.

4,550,789

HYDRAULIC JARRING TOOL

Morgan L. Crow, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 23, 1984, Ser. No. 592,637
Int. Cl.[4] E21B *31/113*
U.S. Cl. 175—297 **5 Claims**



1. An improved hydraulic jarring tool comprising:

an outer cylindrical member;

an inner cylindrical member disposed in spaced relationship therein and defining a closed chamber therebetween containing an operating fluid;

sleeve valve means partitioning said chamber into an upper chamber and a lower chamber, said means being axially driven by one of said members and in sliding sealing engagement with the other whereby relative axial movement of said members changes the volume of each said upper and lower chamber;

a first fluid passage in said sleeve valve means for fluid flow communication between said upper and lower chambers and a flow restriction means in said first passage permitting metered fluid flow during said relative axial movement; the improvement comprising:

a second fluid passage in said sleeve valve means for fluid communication between said upper and lower chambers during said relative axial movement, said second passage containing a normally open valve means responsive to a

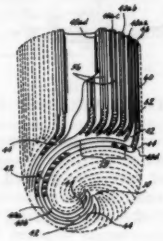
predetermined fluid velocity therethrough for closing said second passage and wherein said sliding sealing engagement between said sleeve valve and said other member becomes open at a predetermined axial location of said sleeve valve, to permit relatively free flow between said upper and lower chamber as the members are moved in a relatively axial direction and said fluid flow velocity through said second fluid passage is dependent upon the rate of relative movement of said members to said predetermined axial location whereby such rate of relative axial movement determines the condition of said normally open valve means.

4,550,790

DIAMOND ROTATING BIT

Howard D. Link, Salt Lake City, Utah, assignor to Norton Christensen, Inc., Salt Lake City, Utah

Filed Feb. 28, 1983, Ser. No. 470,507
Int. Cl.[4] E21B *10/46, 10/60*
U.S. Cl. 175—329 **15 Claims**



1. In a rotating bit having a bit face and center, and including a plurality of polycrystalline diamond elements, each element having a generally triangular prismatic shape characterized by two opposing triangular end surfaces connected by planar side surfaces, said element disposed on said bit face and extending therefrom, an improvement comprising:

disposition of each said polycrystalline diamond element on said bit face wherein said end surfaces of each said element are disposed at an angle with respect to a radius of said rotary bit so that an edge defined by the intersection of an adjacent end and side surface of said element serves as a leading edge with respect to the direction of travel of said element as said bit rotates about said bit center;

wherein each said polycrystalline diamond element is disposed on said bit face on a raised land having an edge and wherein said end surface of each polycrystalline diamond element is approximately parallel to and substantially adjacent to said edge of said raised land; and

wherein said land is disposed on said bit face in a generally spiral pattern whereby said direction of travel of said diamond element is acutely inclined with respect to the longitudinal length of said spirally patterned land,

whereby a dihedral leading edge is provided for cutting and fully parallel flow across said end surface adjacent said leading edge is also provided.

14. In a rotating bit having a center, a bit face and gage for said bit for drilling a bore, an improvement comprising:

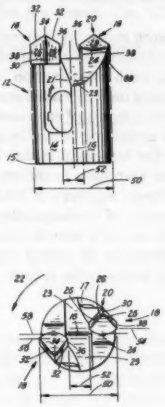
a plurality of cutting teeth disposed on said bit and extending above said bit face, the amount of extension of said plurality of teeth above said bit face defining at each location a clearance between said bit face and said bore drilled by said bit, said plurality of teeth having a graduated height above said bit face beginning at a maximum near said center of said bit and decreasing toward the gage of said bit, the height of said plurality of teeth extending above said face of said bit being approximately inversely proportional to the radial distance of said tooth from said center of said bit, whereby the total flow area (TFA) of said bit is approximately uniform across the face of said bit.

4,550,791

TWO-PRONG ROTARY BIT, ESPECIALLY FOR USE WITH ROOF DRILLS, AND INSERT THEREFOR

Edmund Isakov, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 538,765, Oct. 3, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,027
Int. Cl.[4] E21B *10/54*
U.S. Cl. 175—410 **18 Claims**



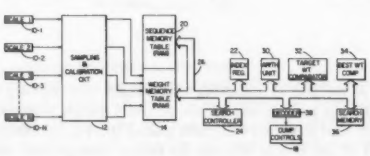
1. A two-prong bit especially for use with roof drills comprising: a supporting body having an axis of rotation; a pair of inserts, each of said inserts having a cutting portion facing in the direction of rotation, a mounting portion and, when viewed in a direction parallel to the axis of rotation, a cross sectional configuration which is generally wedge-shaped and forms a longitudinally extending face cutting edge at the apex of said wedge.

4,550,792

COMBINATION WEIGHING SYSTEM

Oren A. Mosher; Oren G. Mosher, both of Hayward, and Ellwood S. Douglas, Orinda, all of Calif., assignors to Eagle Machinery Company, Oakland, Calif.

Division of Ser. No. 430,354, Sep. 30, 1982, Pat. No. 4,466,500. This application Jun. 6, 1984, Ser. No. 617,973
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] G01G *19/22, 19/00, 19/52*
U.S. Cl. 177—25 **24 Claims**



1. A combination weighing system to search for and obtain a qualified weight of product not less than a target weight from among multiple quantities of the product in a cyclic operation comprising:

a plurality (N) of weighing scales, each receiving and weighing a quantity of product, and providing a weight signal

representative of the weight of the product in the scale when the scale is loaded;

arithmetic means connected with the plurality of scales to receive the weight signals for determining the combined weight of the product in selected combinations of the scales during a search operation;

comparator means connected to the arithmetic means for comparing the total weight of product of a selected combination of the scales with a target weight to identify combinations of scales qualified to form a package of the product at and above the target weight;

dump control means for dumping desired combinations of scales which are qualified in each cycle of machine operation;

combination search means for generating during each cycle of machine operation an ordered search sequence of scale combinations, each combination of the generated sequence consisting only of loaded scales which are ready to be dumped, the weights of each combination being determined by the arithmetic means in a search for a desired combination, the searching means including search control means for searching in different cycles of machine operation different numbers of loaded scales in ordered search sequences of correspondingly different length whereby each step of a search sequence comprehends a different combination of loaded scales regardless of the number (N) of scales in the system.

4,550,793

METHOD AND APPARATUS FOR CHECKING THE WEIGHT OF A MOVING ARTICLE

Alan F. Giles, Welwyn Garden City, England, assignor to Precision Engineering Products Limited (Suffolk), Suffolk, England

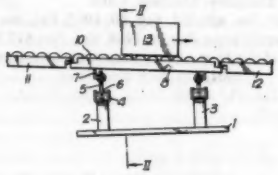
PCT No. PCT/GB82/00143, § 371 Date Dec. 7, 1982, § 102(e) Date Dec. 7, 1982, PCT Pub. No. WO82/04123, PCT Pub. Date Nov. 25, 1982

PCT Filed May 12, 1982, Ser. No. 448,896

Claims priority, application United Kingdom, May 13, 1981, 8114584

Int. Cl.⁴ G01G *19/00, 21/22*

U.S. Cl. 177—145 **6 Claims**



1. A method of checking the weight of a moving article comprising passing the article across a weigh platform connected to at least two load cells spaced apart in the direction of travel of the article, sensing the output signals from the load cells, equating the output signals from each of the load cells to determine when the output signals from the load cells are equal and the article is correctly positioned on the platform for weighing, and adding together the output signals from the load cells when they are equal to provide a measure of the weight of the article and indicating only that measure of the sum of the output signals.

4,550,794

MOTORCYCLE HAVING AN ENGINE WITH A SUPERCHARGER

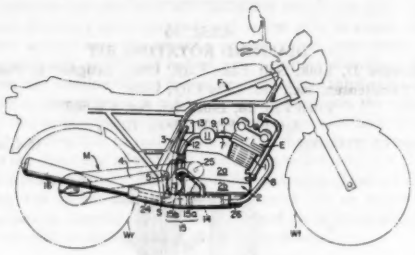
Kazuo Inoue, Tokyo, and Tsuneo Otsuka, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,472

Claims priority, application Japan, Jan. 14, 1981, 56-4368; Jan. 20, 1981, 56-6660; Jan. 20, 1981, 56-6662; Jan. 20, 1981, 56-6663; Jan. 22, 1981, 56-8225; Jan. 26, 1981, 56-9823

Int. Cl.⁴ B60K *13/00*

U.S. Cl. 180—219 **11 Claims**



1. A motorcycle comprising a frame member and an engine mounted on said frame member, a rear fork having at least one shaft at its front end connected to said frame member for vertical oscillation, said rear fork supporting at its rear end a rear wheel, a transmission case integrally mounted at the rear of said engine, a supercharger disposed backwardly of said transmission case below said rear fork shaft for compressing intake air fed to said engine, said supercharger comprising a turbine in an exhaust passage means and adapted to be driven by exhaust gas discharged from said engine as well as a compressor disposed in an intake passage means and connected with said turbine for rotation therewith for compressing intake air in said intake passage means, and an air cleaner connected to said compressor of the supercharger through said intake passage means, wherein said intake passage means comprises an upstream portion for connection between said air cleaner and said compressor and a downstream portion having a prechamber interposed therein on the side closer to said engine and being so formed as to extend upwardly from said compressor to pass by said rear fork shaft, said air cleaner being located rearwardly of said prechamber as well as said downstream portion of the intake passage means with respect to the advancing direction of the motorcycle.

4,550,795

EXHAUST SUPPORT SYSTEM

Hitoshi Teshima, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 15, 1984, Ser. No. 660,877

Claims priority, application Japan, Oct. 14, 1983, 58-193120

Int. Cl.⁴ E21F *17/02*; F16F *7/00*

U.S. Cl. 180—296 **16 Claims**

1. An exhaust support system for a midship engine rear wheel drive-type vehicle having a transversely mounted engine, comprising:

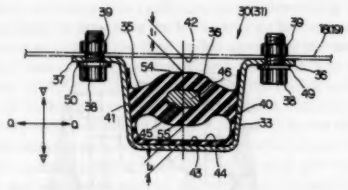
a cylindrical exhaust device extending in a lateral direction across the vehicle, having an inlet passage and an outlet passage;

an exhaust pipe having an inlet passage communicated with the engine and outlet passage communicated with said inlet passage of the exhaust device;

a first and a second mounting means for mounting said cylindrical exhaust device onto a body portion of the vehicle, each of said mounting means comprising:

a bracket secured onto the vehicle body portion;

a resilient member having an upper surface and a lower surface, said resilient member being contained within said bracket such that the resilient member is fixed to said bracket at vertical portions thereof and a vertical clearance is provided between said upper surface on the



resilient member and said vehicle body portion and a vertical clearance is provided between said lower surface of the resilient member and said bracket; and

a support rod fixed to said cylindrical exhaust device at one end thereof and a second end is slidably fixed to said resilient member at a second end thereof.

4,550,796

MOUNT FOR LOUDSPEAKER ON VEHICLE PANEL

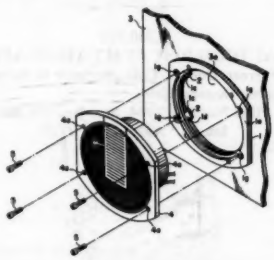
Shuichi Tomita, Yamagata, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,444

Claims priority, application Japan, Dec. 20, 1983, 58-196072[U]

Int. Cl.⁴ H04R *1/20*

U.S. Cl. 181—141 **4 Claims**



1. A mount for mounting a loudspeaker on a panel of a vehicle or the like, comprising:

a spacer having an aperture formed therein shaped to receive said loudspeaker;

a plurality of fitting inserting members provided around an inside periphery of said aperture in said spacer, each of said fitting inserting members comprising an arm protruding inwardly from an underside of said spacer, and a sack-shaped fitting inserting member extending from an inward end of said arm said arm having a mounting hole formed therein aligned with a hole in said spacer inwards of said fitting inserting member, and a hinge connecting said arm to said spacer; and

a fitting shaped to be received in one of said fitting inserting members, said fittings each having a screw hole for supporting a mounting screw on an underside of a respective one of said holes in said spacer,

wherein said loudspeaker is mounted in said panel by placing said spacer over a corresponding aperture in said panel, bending said fitting inserting members so as to hold said spacer to said aperture in said panel and align said screw holes in said fittings with the corresponding holes in said spacer, inserting said loudspeaker into said aperture in said spacer, and screwing screws through screw holes formed in said loudspeaker and into said screw holes in said fittings through said holes in said spacer.

4,550,797

LOUDSPEAKER DIAPHRAGM MADE OF A MOLDED, SINTERED CERAMIC BODY

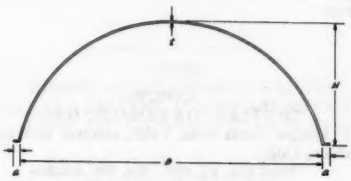
Kiyoaki Suzuki, Zama; Hidetsugu Suzuki, Sagamihara; Katsuhiro Onuki, Tokyo; Isami Nomoto, Yokohama; Yoshiaki Fukuda, and Takeshi Sato, both of Yokoze, all of Japan, assignors to Victor Company of Japan, Yokohama and Mitsubishi Mining & Cement Co., Ltd., Tokyo, both of, Japan

Filed Jan. 17, 1984, Ser. No. 571,652

Claims priority, application Japan, Jan. 17, 1983, 58-4143; Sep. 8, 1983, 58-164244

Int. Cl.⁴ G10K *13/00;* **H04R** *7/00*

U.S. Cl. 181—167 **7 Claims**



1. A ceramic loudspeaker diaphragm in cone or domed form and having an opening at one end thereof, said diaphragm comprising crystal grains of a ceramic, said crystal grains having a maximum size of below 1/5 times a thickness of said diaphragm, the thickness of said diaphragm ranging from 30 to 100 microns.

4,550,798

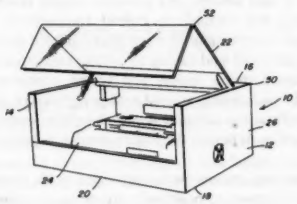
ACOUSTIC PANEL AND ENCLOSURE

Henry D. Swartz, Chestnut Hill, Mass., and Alan H. Miller, Hickory, N.C., assignors to Anechoic Systems Company, Inc., Westwood, Mass.

Filed Jan. 4, 1985, Ser. No. 688,649

Int. Cl.⁴ B41J *29/08;* **E04B** *1/82*

U.S. Cl. 181—201 **13 Claims**



8. An acoustic enclosure comprising:

(a) a pair of side panels, each said side panel including a polymeric outer stratum, a thermoplastic intermediate stratum having inner and outer sheets disposed parallel to one another and a plurality of interior walls forming a plurality of internal chambers between said inner and outer sheets, the longitudinal axis of each said internal chamber lying in a plane which is in spaced parallel relationship to the plane in which the polymeric outer stratum lies, and an inner stratum composed of an open celled acoustic material, said outer, intermediate, and inner strata superposed on one another and fixed to one another;

(b) a rear panel having an open celled acoustic material outer stratum, a thermoplastic intermediate stratum and an open celled acoustic material inner stratum, said strata of said rear panel being superposed on one another and in a fixed relationship to one another;

(c) a bottom panel having an inner stratum composed of an open celled acoustic material, an intermediate stratum composed of a thermoplastic material and an outer stratum composed of an open celled acoustic material, said strata of said bottom panel being superposed on one another and in a fixed relationship to one another;

(d) said side panels, said rear panel and said bottom panel attached to one another to form an enclosure having an opening at the top and front; and

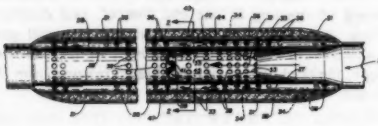
(e) a cover hinged to said enclosure, said cover moveable between an open position and a closed position, said enclosure being closed when said cover is in said closed position and opened when said cover is in said open position.

4,550,799

MUFFLER FOR EXHAUST GASES

Ray T. Flugger, Santa Rosa, Calif., assignor to Wayne King, Modesto, Calif.

Filed Feb. 22, 1983, Ser. No. 468,866
Int. Cl.[4] F01N *1/24*
U.S. Cl. 181—244 **4 Claims**



1. A muffler for exhaust gases or the like having a sound component therein, said muffler including a casing having a fluid inlet opening and a fluid outlet opening, stream forming means positioned proximate said inlet opening and formed to direct exhaust gases in a stream inside said casing from said inlet opening toward said outlet opening, sound absorbing material positioned to extend longitudinally inside said casing laterally of said stream, and partition means positioned inside said casing and formed to extend transversely across said stream and to terminate in a periphery of said partition means spaced apart from said casing to deflect said stream formed by said stream forming means and sound components therein laterally in said casing around said periphery of said partition means for flow toward said sound absorbing material and said outlet opening, wherein the improvement in said muffler comprises:

said partition means being provided with stream splitting means formed to positively divide said stream into a plurality of stream portions for flow around said periphery of said partition means, said stream splitting means being positioned in said casing proximate the center of the area of impact of said stream with said partition means to laterally deflect stream portions of substantially equal volume toward said sound absorbing material to prevent perferential erosion of said sound absorbing material, and

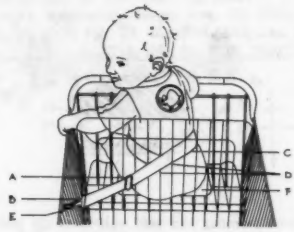
said stream formed means and said stream splitting means being further formed to cooperatively define a plurality of flow paths for exhaust gases which extend through said casing from said inlet opening around said periphery of said partition means to said outlet opening without reversal of the direction of flow of said gases for low backpressure flow of said gases through said muffler.

4,550,800

SHOPPING CART SAFETY BELT

Glory A. Dietrich, 8406 Sedan Ave., Canoga Park, Calif. 91304

Filed Jan. 24, 1983, Ser. No. 449,406
Int. Cl.[4] B62B *9/24;* **A47D** *15/00*
U.S. Cl. 182—3 **1 Claim**



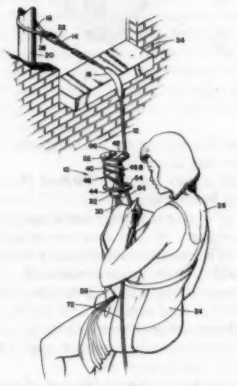
1. The method of securing a child to a shopping cart of the type having a seat forming part of a basket made from heavy wires or rods, wherein said seat includes a back rest, using a safety belt of the type made from a webbing material and having at one end a snap hook and at the other end a slide engaging said webbing at a point intermediate both ends and forming an adjustable loop, placing the child on the seat, placing said loop around the child, inserting the safety belt and part of said loop between a pair of wires or rods forming the seat back, pulling on said safety belt until the child is held firmly against the seat back to ensure a snug fit of the webbing around the child and attaching said snap hook to one of the wires or rods forming said basket.

4,550,801

PERSONAL HIGH RISE EVACUATION APPARATUS

William E. Forrest, Denver, Colo., assignor to Advanced Evacuation Systems, Denver, Colo.

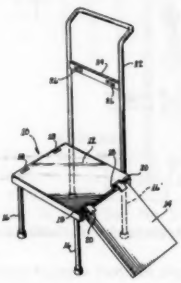
Filed Nov. 29, 1984, Ser. No. 676,386
Int. Cl.[4] A62B *1/14, 1/20*
U.S. Cl. 182—7 **10 Claims**



1. A descent control device for use with a load-carrying harness suspended therefrom to lower a load down on a rope from an elevated position where one end is anchored to a relatively lower position reached by its free end which comprises: a friction drum of a length adapted to receive a plurality of turns of rope wrapped therearound, said drum having an upper end and a lower end; top and bottom endplates attached respectively to the upper and lower ends of said drum, said

endplates both having a portion thereof overhanging said drum, each of said overhanging portions containing an aperture therethrough sized to loosely receive the rope, the aperture in the bottom plate including at least one arcuate slot with an entryway of a width adapted to freely admit the rope opening into the latter, said slot tapering from said entryway as it follows the contour of the drum part way therearound to a relatively narrower blind end; and means depending from the bottom plate for attaching the load-carrying harness, said drum with several turns of the rope coiled upwardly therearound in the direction of the slot cooperating therewith and with the aperture in the top endplate when the free end of said rope is allowed to hang free and seek a position intermediate the entryway and blind end of said slot to slowly lower the load at a predetermined safe rate, said slot providing means for varying the descent rate by manually positioning the rope therealong, and said slot becoming operative as a manually-actuated brake when the free end of the rope is tensioned and held in the blind end thereof.

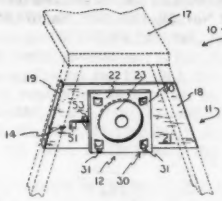
4,550,802
FOOTSTOOL WITH INCLINED RAMP
Colleen F. Roper, 8935 W. Peoria Ave., Peoria, Ariz. 85345
Filed Dec. 31, 1984, Ser. No. 687,950
Int. Cl.[4] A47C *9/00*
U.S. Cl. 182—113 **19 Claims**



1. A footstool comprising:
a top, supporting legs, a removable inclined ramp;
engagement means for attaching an end of said ramp to said top; and
an upwardly extending handle and support railing.

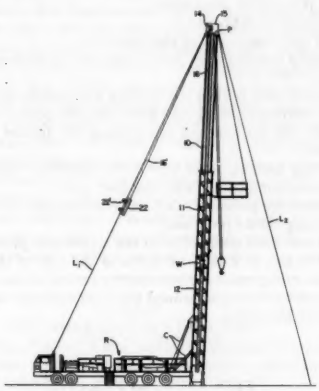
4,550,803
ADJUSTABLE IMPLEMENT HOLDER FOR STEPLADDERS
Emma R. Finster, and Peter W. Finster, both of 217 Glasgow St., Kitchner, Ontario, Canada
Filed Feb. 4, 1985, Ser. No. 697,612
Int. Cl.[4] E06C *7/14*
U.S. Cl. 182—129 **8 Claims**

1. An apparatus for adjustably supporting diverse articles on a stepladder wherein the apparatus comprises:
a base unit including a base member whose outboard edges are adapted to frictionally engage the exterior surface of the stepladder legs;
a support unit rotatably mounted on said base unit;
an article securing means releasably engaged by said support unit, and adapted to operatively support diverse articles; and



a releasable locking means operatively associated with said base unit, and said support unit for restricting the relative rotation between said base unit, and said support unit.

4,550,804
CLIMBING ASSIST APPARATUS HAVING CONTROLLED DESCENT AND ESCAPE MECHANISM
Bruce L. Bummer, 5017 Alcova Rte., P.O. Box 56, Casper, Wyo. 82604
Filed Feb. 15, 1984, Ser. No. 580,523
Int. Cl.[4] A62B *35/02, 1/12*
U.S. Cl. 182—233 **9 Claims**



1. In climbing assist apparatus adapted for use in climbing a ladder on a derrick and the like wherein a cable is attached to a worker climbing the ladder, said cable being trained over a sheave mounted at the upper end of said ladder and said cable passing downwardly and connected to counterweight means to remove any slack in said cable as the worker is climbing the ladder, the improvement comprising:
positive displacement motor drive means including a motor drive shaft keyed to said sheave, said motor drive means being freely rotatable in one direction of rotation in response to advancement of said cable over said sheave as the worker is climbing said ladder; and
a hydraulic fluid circuit including flow controller means in said circuit applying a predetermined resistance to rotation of said motor drive in response to the application of force by said cable to said motor drive shaft in a direction opposite to the one direction whereby to control the rate of descent of the worker in the event of a fall or escape from the ladder.

4,550,805

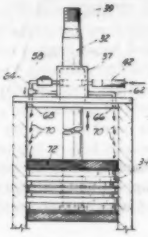
HYDROSTATIC LUBRICATION SYSTEM FOR A WALKING BEAM

Gregory L. Zimmerman, 625 S. Patton, Denver, Colo. 80209

Filed Nov. 30, 1984, Ser. No. 676,852

Int. Cl.[4] F16N *1/00*

U.S. Cl. 184—18 **4 Claims**



1. An improved lubrication system for the hydrostatic lubrication of a bearing mounted in a bearing housing and disposed around a piston shaft and cooling a piston and inner cylinder wall of a walking beam compressor, the compressor mounted on a walking beam pump, the piston connected to a piston shaft which is raised and lowered by the movement of the walking beam of the walking beam pump, the shaft supported by the bearing housing having the bearing disposed around the piston shaft, the compressor used for compressing low pressure natural gas, the system comprising:

a pressure oil lubricator;

an oil line connected to the lubricator;

a bearing housing inlet port in the side of the bearing housing;

a bearing inlet port in the bearing and communicating with the bearing housing inlet port, the inlet ports receiving oil from the oil line and introducing oil around the piston shaft;

a bearing housing outlet port in the side of the bearing housing communicating with the inlet port;

an adjustable pressure relief valve connected to the bearing housing outlet port; and

excess oil lines connected to the adjustable pressure relief valve and to excess oil ports in the top of the walking beam compressor for introducing excess oil into the top of the compressor and around the inner cylinder wall and the top of the piston.

4,550,806

ELEVATING APPARATUS

Albert Bocker, Werne, Fed. Rep. of Germany, assignor to Albert Bocker GmbH & Co. KG, Fed. Rep. of Germany

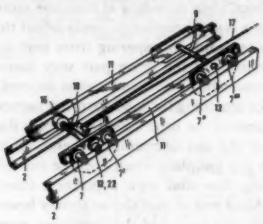
Filed Jun. 10, 1983, Ser. No. 503,288

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222508

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—10 **6 Claims**

1. A load-carrying elevator having a first linear section inclined at a specified angle and a second linear section downwardly inclined from the higher end of the first section, a pair of spaced tracks located on said sections and forming guide rail extensions from one section to the other, a chassis arranged to travel along said tracks and movable by means of a cable, said chassis comprising spaced side plates, a pair of axles extending between said side plates spaced at intervals along the length of the chassis, rocker arms mounted on each of said axles and pivoted therewith, rollers mounted on said rocker arms engaging the underside of the tracks, and rollers mounted on said rocker arms at either side of the axle arranged to roll on the top surface of the tracks, the load on the carriage being distributed between the axle while the load on each axle is distributed between the rollers engaging the top of the track, the construction being such as to enable a smooth transition of the carriage from a position where both axles are over the first linear section of the elevator to one where one axle is over the first section and the other axle is over the second section of the elevator.



4,550,807

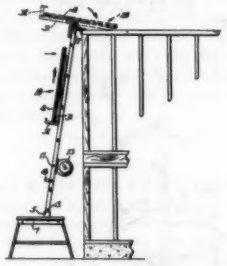
BUILDING CONSTRUCTION LIFT APPARATUS

Eilef J. Ohlgren, Rte. 2, Box 23, Clear Lake, Minn. 55319

Filed Aug. 4, 1983, Ser. No. 520,419

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—10 **4 Claims**



4. A portable lift apparatus for use in building construction comprising:

(a) two elongated spaced apart support members extending in a generally vertical direction, each including an upper end and a lower end;

(b) each of said elongated support members including separate means for independently stabilizing said elongated support members with respect to a building structure;

(c) conveyor means associated with each of said elongated support members for movement generally along the longitudinal extent of said elongated support members between said upper and lower ends;

(d) said conveyor means of each of said elongated support members being operatively interconnected to one another by universal joint means providing for cooperative conveying action by said conveyor means such that said conveyor means move at generally the same speeds and in generally the same direction, said universal joint means being readily detachable to enable said conveyor means to be readily interconnected for operation and disconnected for transport;

(e) said conveyor means each including a lift bracket means for cooperatively supporting an article conveyed by said conveyor means, said lift bracket means being configured to pivot said article toward the building structure about a generally horizontal axis proximate the upper ends of said elongated support members;

(f) on each of said elongated support members, a chain passing around a first and a second pulley, the first pulley

being mounted at said upper end of said support member, the second pulley being mounted near the lower end of said support member and at least one of said pulleys being sprocketed to interact with said chain such that when said sprocketed pulley rotates said chain passes around said pulleys and moves said lift bracket means, said lift bracket means being pivotally mounted on said endless chain; and

(g) on the first of said elongated support members,

(i) a motor connected to the sprocketed pulley mounted on the same elongated support member for causing said sprocketed pulley to rotate;

(ii) two or more rods and one or more universal joints detachably connected to each other and interacting to connect said motor with the sprocketed pulley mounted on the second of said support members to allow said motor to rotate said sprocketed pulley on said second support member and for adjusting the relative rotation rates of the sprocketed pulley mounted on the first said support member and the sprocketed pulley on the second said support member such that said lift members mounted on each of said chains will each move at substantially the same speeds and for substantially the same distance when said sprocketed pulleys are rotated by said motor.

4,550,808

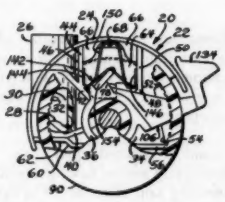
BRAKE FOR TWIN WHEEL CASTERS

Henry J. Folson, Redondo Beach, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 30, 1984, Ser. No. 575,135

Int. Cl.⁴ B60B *33/00*; F16D *51/00*

U.S. Cl. 188—1.12 **10 Claims**



1. A braking wheel construction comprising a wheel having a cylindrical flange with the inner surface thereof accessible as a brake drum, means for mounting said wheel including an axle, a brake operating lever pivotable about said axle, a brake shoe engageable with said inner surface, and an over center mechanism including a flat link member capable of snapping into and out of spreading engagement between said brake operating lever and said brake shoe, and spring means for resiliently urging said shoe out of engagement with said surface, a first edge of said link being disposed in a notch in said lever, and a second edge of said link being in contact with said shoe, whereby pivoting of said lever in one direction forces said shoe into braking engagement with said surface and said shoe is released from such braking engagement upon pivoting of said lever in an opposite direction.

4,550,809

DISC BRAKE SYSTEM WITH FAN MEANS

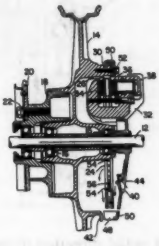
Takeshi Kawaguchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 340,768, Jan. 19, 1982, abandoned, and a continuation-in-part of Ser. No. 340,770, Jan. 19, 1982. This application Jul. 12, 1982, Ser. No. 397,506

Claims priority, application Japan, Jan. 24, 1981, 56-8584; Jan. 24, 1981, 56-8585; Feb. 6, 1981, 56-14957[U]; Feb. 6, 1981, 56-14958[U]; Jul. 17, 1981, 56-105319[U]; Jul. 17, 1981, 56-105317[U]; Jul. 17, 1981, 56-105318[U]; Jul. 17, 1981, 56-105320[U]

Int. Cl.⁴ B60T *1/06*; F16D *55/224, 65/12*

U.S. Cl. 188—18 A **6 Claims**



1. A disc brake system for a motorcycle having a wheel hub including a brake disc fixed on one side to said hub to rotate with said hub, said brake disc including radial passages therethrough defining a plurality of webs between said passages, a caliper member fixed to the motorcycle in braking engagement with said brake disc, a side panel of substantially the same diameter as said brake disc covering said brake disc and having a cooling air introduction port, wherein the improvement comprises a radial flow fan means for inducing radial outward air flow from said brake disc, said fan means having a plurality of vanes positioned adjacent the periphery of said brake disc and aligned with said webs, a shroud ring extending from the periphery of said side panel to cover the outer surface of said radial flow fan means and a flange on said hub extending radially to cover the inner surface of said radial flow fan means.

4,550,810

DISC BRAKES FOR VEHICLES

Anthony G. Price, Gwent, Wales, and Roy Campbell, Worcestershire, England, assignors to Lucas Industries public limited company, England

Filed Nov. 21, 1983, Ser. No. 553,759

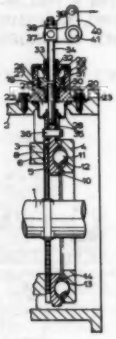
Claims priority, application United Kingdom, Nov. 25, 1982, 8233692

Int. Cl.⁴ F16D *55/39, 55/40*

U.S. Cl. 188—71.4 **12 Claims**

1. A disc brake for vehicles comprising a stationary housing having a relatively stationary surface, at least one friction disc having a braking face of annular outline and a peripheral edge, said disc being rotatable within said stationary housing and adapted to be moved axially into engagement with said relatively stationary surface, and actuating means for moving said friction disc into engagement with said surface to apply said brake, said actuating means comprising at least one pressure plate superimposed upon said braking face and having spaced side edges located outside said peripheral edge of said disc, a non-rotatable reaction member, and camming means cooperating with said pressure plate and said reaction member, movement of said pressure plate in a radial direction relative to said reaction member causing a camming effect to be produced so that said pressure plate moves axially to urge said friction disc into engagement with said surface, means for producing said movement in said radial direction, and further means for constraining said pressure plate against angular movement,

said further means comprising means rigid with said housing defining first parallel guide surfaces located outside said peripheral edge of said disc, and second parallel guide surfaces on said side edges of said pressure plate for slidable engagement with said first guide surfaces, said engagement between said first and second guide surfaces being so constructed and arranged as to positively guide said pressure plate for total bodily



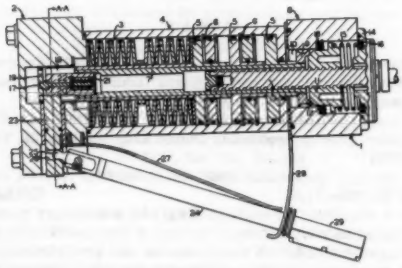
movement in said radial direction in response to operation of said means for providing said movement in a radial direction, to prevent angular movement of said pressure plate with respect to said reaction member, but to permit movement of said pressure plate in an axial direction with respect to said reaction member at the same time as said pressure plate is being moved in said radial direction.

4,550,811

MANUALLY RELEASABLE PARKING BRAKE DEVICE

Steven C. Rumsey, N. Huntingdon, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Feb. 6, 1984, Ser. No. 577,406
Int. Cl.[4] F16D *65/24*
U.S. Cl. 188—170 **17 Claims**



1. A manually releasable, spring-applied, air-released parking brake device comprising:

(a) a cylinder housing;

(b) a non-rotatable spindle coaxially disposed in said housing;

(c) spring means disposed in said housing for exerting an axial spring force in a direction to effect a brake application;

(d) piston means subjectable to fluid pressure for exerting an axial force in opposition to such spring force such that, said spring means is compressed to effect a brake release;

(e) clutch means threadingly engageable with said spindle for selectively engaging and disengaging said spring means with said spindle, said clutch means having at least a portion which is rotatable;

(f) a guide rod coaxially extending through at least a portion of said housing and being secured to a portion of said clutch means;

(g) a spline member secured to the end of said guide rod opposite said clutch means for movement therewith, said spline member having a plurality of spline grooves formed externally thereon;

(h) latching means extending partially within said housing and having at least one extending surface for engaging at least one of said plurality of spline grooves and restraining said spline member from rotational movement;

(i) manual-release means connected to said latching means for manually removing said extending surface of said latching means from engagement with said spline groove; and

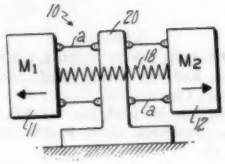
(j) blocking means retractably connected to said spline member for blocking said extending surface of said latching means from engagement with said spline groove following operation of said manual-release means and until said guide rod is moved axially to a brake-release position.

4,550,812

FIXED POSITION, FIXED FREQUENCY PENDULAR-TYPE VIBRATION ABSORBER WITH FREQUENCY LINEARIZATION

Kenneth C. Mard, Stratford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 931,085, Aug. 4, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 185,070
Int. Cl.[4] F16F *7/10*
U.S. Cl. 188—379 **8 Claims**



1. A fixed frequency vibration absorber adapted to be fixedly attached to a vibration prone system to cooperate with the principal vibration excitation source which primarily generates vibrations in a given direction so as to control system vibrations and comprising:

base means,

two mass means of selected equal mass,

pendular connecting means, having a pendular arm of length "a", connecting said mass means in opposed positions to said base means for support from and allochiral pendular motion in said given direction.

spring means operatively connected between said mass means in selectively preloaded condition to exert a force "Fnr"on said mass means to establish the desired natural frequency thereof, and to also cause said mass means to move in coincident, allochiral pendular motion so that motion of said mass means produces additive forces in said given direction to absorb the vibration force established by said principal source, and so that all other forces so produced mutually cancel, said spring means also being of selected spring rate "Ks" to compensate for the spring rate reduction caused by pendular motion of the pendular connecting means and thereby provide an essentially linear spring rate acting on said mass means for angles of pendular motion "θ" of at least $\pm 45°$, so that the natural frequency of the vibration absorber is substantially con-

stant throughout this range of operation, and wherein "Ks" is selected according to the equation:

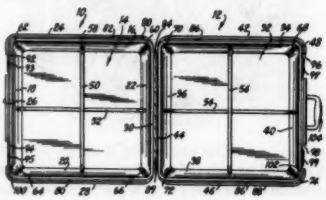
$$K_s = F_{nr}/a\left[\frac{\left(1-\frac{\sin\theta}{\theta}\right)\left(\frac{\theta}{2\sin\theta}\right)}{(1-\cos\theta)}\right]$$

4,550,813

MOLDED WHEELED LUGGAGE, ENSEMBLE THEREOF AND PROCESS FOR MAKING THE SAME

Arthur J. Browning, P.O. Box 4508, Toms River, N.J. 08754-4508

Filed Mar. 28, 1984, Ser. No. 594,122
Int. Cl.⁴ A45C *13/26*
U.S. Cl. 190—18 A **37 Claims**



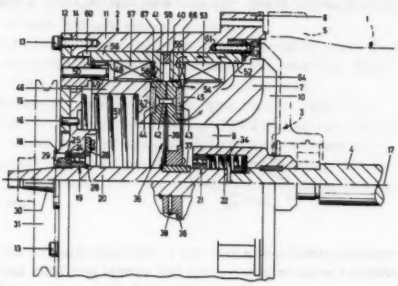
1. A lightweight, strong, molded, rigid, plastic luggage comprising in combination a first molded one-piece plastic section and a second molded one-piece plastic section adapted to cooperate with each other, each of said sections including a side panel, four integrally molded, sloping walls having sloping curved corners and angled edges projecting upwardly from and enclosing said side panel; integrally molded support means disposed on the side panel of at least one of said sections extending up said walls towards said angled edges substantially midway between the ends of said walls; each of said sections further being provided with integrally molded butt hinge means and a reinforcing rib disposed on the periphery of one of said walls and a plurality of shaped recesses for receiving the cooperating halves of locks or catches disposed on the wall directly opposite; the wall provided with the butt hinge means of at least one of said sections also being provided with at least two integrally molded feet located in the vicinity of the ends of and opposite said butt hinge means; three of the walls of said second section being porvided with a pair of peripheral parallel ribs forming an offset groove extending continuously around and near the periphery thereof and three of the walls of said first section being provided with an offset tongue including a supporting rib which extends continuously around and near the periphery thereof; the butt hinge means on said first and second sections being positioned thereon so that they interleave with each other and form a continuous passageway for reception of a hinge pin, said offset tongue and said offset groove being positioned on the respective sections so that they mate and said shaped recesses being positioned on the respective sections so that they are located across from each other when said sections are assembled in cooperative relationship.

4,550,814

ELECTROMAGNETIC CLUTCH-BRAKE FOR INDUSTRIAL SEWING MACHINE

Alan J. Harry, Royston, England, assignor to Frankl & Kirchner GmbH & Co. KG Fabrik für Elektromotoren u. elektrische Apparate, Schwetzingen/Baden, Fed. Rep. of Germany

Filed Oct. 12, 1982, Ser. No. 433,607
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142570
Int. Cl.⁴ B60K *41/24*
U.S. Cl. 192—18 B **6 Claims**



1. A clutch-and-brake unit for use with a continuously-rotating, motor-driven shaft, comprising:

(a) a rotatable shaft;

(b) a disk connected to the rotatable shaft for rotation therewith and having a clutch surface on one side and a brake surface on the other side, the disk being secured against axial movement relative to the rotatable shaft and comprising a spider which is resiliently bendable axially of the shaft;

(c) a clutch pressure plate rotated by the motor-driven shaft and facing the clutch surface of the disk;

(d) a brake pressure plate facing the brake surface of the disk, secured against rotation, and movable axially of the rotatable shaft into engagement with the brake surface;

(e) means for constantly urging the brake pressure plate into engagement with the brake surface of the disk with a force which is sufficient to brake the disk against rotation only when the clutch surface of the disk is not operatively engaged with the clutch pressure plate, the resilient force of the spider and the force of the means for constantly urging the brake pressure plate into engagement with the brake surface being in equilibrium; and

(f) clutch and brake surfaces of the disk respectively into clutching and braking operative engagement with the clutch and brake pressure plates.

4,550,815

CLUTCH WEAR INDICATOR

Ronald J. Gale, Hornchurch, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

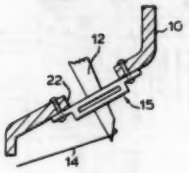
Filed Oct. 27, 1983, Ser. No. 546,147
Claims priority, application United Kingdom, Dec. 24, 1982, 8236770
Int. Cl.⁴ F16D *23/00*
U.S. Cl. 192—30 W **7 Claims**

1. A clutch wear indicator adapted for use with a clutch which comprises a clutch lining and which is mounted within a clutch housing, wherein a clutch actuating lever operably engages said clutch and extends through an aperture in said clutch housing, said clutch actuating lever being adapted to travel a distance from a clutch release position to a first clutch engaged position corresponding to an unworn clutch lining and a greater distance to a second clutch engaged position

corresponding to a substantially worn clutch lining, said clutch wear indicator comprising:

a base mounted to said clutch housing about said aperture, said clutch actuating lever extending through an aperture in said base:

a carrier frame mounted within the aperture of said base via an engagement which permits movement of said carrier frame relative said base in the direction of movement of said clutch actuating lever for clutch release and substantially no movement relative said base in other directions, said clutch actuating lever extending through an aperture in said carrier frame and movable therein from a clutch



engaged position at a first end of said aperture to a clutch released position at a second end of said aperture: and

contact means mounted to said carrier frame and operably connected to signal means adapted to give a signal upon actuation of said contact means, said contact means being adapted for actuation by contact with said clutch actuating lever:

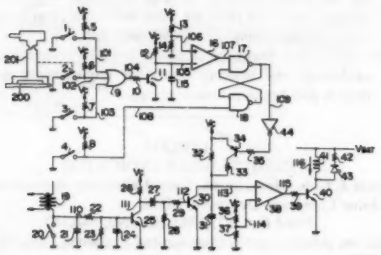
wherein said carrier frame is movable in said base by movement of said clutch actuating lever to a location at which said contact means is positioned to be in contact with said clutch actuating lever in said clutch engaged position corresponding to a worn clutch lining.

4,550,816

SYSTEM FOR CONTROLLING STALL SPEED FOR AN ELECTROMAGNETIC CLUTCH

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,333
Claims priority, application Japan, Jan. 29, 1982, 57-13550
Int. Cl.⁴ F16D *37/02*; B60K *41/00, 41/02*
U.S. Cl. 192—0.052 **16 Claims**



1. A system for controlling stall speed for an electromagnetic clutch having a magnetizing coil for engaging a crankshaft of an internal combustion engine with an input shaft of a transmission of a vehicle, comprising:

means comprising a first electric circuit for allowing clutch current to flow through said magnetizing coil;

means comprising a second electric circuit for increasing said clutch current with an increase of engine speed;

a third electric circuit having two states, one of said states being a low clutch current providing state which decreases the clutch current;

heavy load detecting means for producing a first signal at heavy load conditions of the engine;

means comprising a vehicle speed switch for producing a second signal in a low vehicle speed range below a low predetermined speed;

gate circuit means responsive to simultaneous occurrence of the first and second signals for producing a third signal;

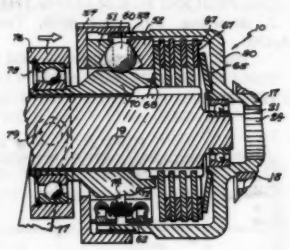
means comprising a fourth electric circuit responsive to the third signal for producing a fourth signal for changing said third electric circuit to the low clutch current providing state.

4,550,817

MECHANICAL CLUTCH

John W. Euler, Benton Harbor, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Feb. 29, 1984, Ser. No. 585,248
Int. Cl.⁴ F16D *13/42, 15/00*
U.S. Cl. 192—70.23 **19 Claims**



1. A mechanical clutch comprising, in combination, a first shaft, a cup element fixed to the first shaft, first discs radiating inwardly from the first shaft and mounted for rotation with the first shaft and for limited axial movement therealong, a second shaft coaxial with the first shaft, second discs radiating outwardly from the second shaft and interleaved with the first discs to form a disc stack, collar cam means carried by the cup element and including a collar cam movable element movable in a first direction to squeeze the disc stack and couple the shafts and movable in a second direction to release the disc stack and permit the shafts to rotate freely of one another, a collar cam fixed element, interconnector means interposed between said collar cam fixed and movable elements for urging the movable collar cam element in said first direction, ring means carrying said collar cam fixed element, and threaded attachment means for attaching said ring means to said cup element, the threaded attachment means having an axis substantially coincident with a clutch shaft so as to permit the position of the collar cam fixed element to be adjusted along the axis of said shaft.

4,550,818

COIN HANDLING APPARATUS FOR USE IN MERCHANDISE VENDING MACHINES

Robert A. Holliday, 4046 N. 80th Dr., Phoenix, Ariz. 85033

Filed Oct. 24, 1983, Ser. No. 544,791
Int. Cl.⁴ G07F *9/04*
U.S. Cl. 194—1 D **23 Claims**

1. A coin handling apparatus for use in a vending machine comprising:

(a) housing means defining an internal caivty;

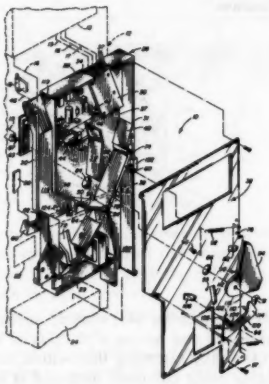
(b) an escrow box in the internal cavity of said housing means for receiving coins from the vending machine, said escrow box including,

I. a first pivot pin means in the internal cavity of said housing means,

II. a coin return gate having one end mounted on said first pivot pin means for pivotable movement from a normally closed position wherein said coin return gate extends angulady upwardly from said first pivot pin means to an open position wherein said coin return gate extends angularly downwardly from said first pivot pin means,

III. a second pivot pin means in the internal cavity of said housing means in angularly upwardly spaced relationship with respect to said first pivot pin means,

IV. a vend gate having one end mounted on said second pivot pin means and having an extending end, said vend gate being pivotably movable from a normally closed position wherein it extends angularly downwardly from



said second pivot pin means with its extending end in bearing engagement with the one end of said coin return gate to an open position wherein the extending end of said vend gate is spaced from the one end of said coin return gate;

(c) biasing means connected between said housing means and said vend gate to bias said vend gate to its closed position; and

(d) a vend cam rotatably movable on said housing means and having a cam surface, said vend cam being rotatably movable from an inoperative position to an operative position wherein the cam surface thereof is in bearing engagement with said vend gate to move said vend gate to its open position against the bias applied thereto by said biasing means.

4,550,819

COIN APPARATUS

Barry L. Smith, Florissant, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 24, 1982, Ser. No. 422,956

Int. Cl.[4] G07F *1/04, 5/08*

U.S. Cl. 194—1 N **11 Claims**

1. For use in a coin-controlled vending machine which has first and second dispensing members manually operable by purchasers to obtain items of a first and a second price, respectively, means for locking said dispensing members against operation to obtain any item comprising a first latch and a second latch, each of said latches being movable between a locking position and a retracted position permitting operation of a dispensing member, the first latch normally occupying its locking position and the second normally occupying its retracted position and being movable to its locking position on operation of a second dispensing member,

coin apparatus for controlling said latches comprising:

a first latch release member for releasing said first latch;

a second latch release member for releasing the second latch;

coin chute means for coins of different denominations;

logic means for totalizing the value of coins passing through the chute means;

means for storing data as to said first and second prices at which items are to be vended;

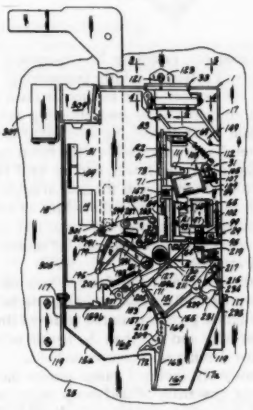
means controlled by the logic means for operating the first latch release member upon the totalized value reaching the first stored price and operation of a first dispensing member, thereby to effect release of said first latch, and for operating both latch release members upon the totalized value reaching the second stored price and operation of a second dispensing member, thereby to effect release of said first and second latches;

each latch release member being movable away from a retracted position for releasing the resective latch and being biased to its retracted position; and

the means controlled by the logic means comprising:

first solenoid-operated means for holding the first latch release member against latch-releasing movement;

second solenoid-operated means for holding the second latch release member against latch-releasing movement; and



means operable on manual operation of a first dispensing member for moving the first latch release member, upon its release, away from its retracted position for releasing the first latch and operable on manual operation of a second dispensing member for moving both latch release members, upon their release, away from their retracted position for releasing both latches.

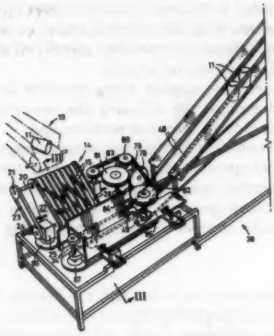
10. Coin apparatus comprising first, second and third chutes for coins of a first, a second and a third denomination, said chutes being located in side-by-side relation, first means for projecting a first beam of light across the first and third chutes, a first sensor for sensing said first beam, second means for projecting a second beam of light across the first and second chutes, and a second sensor for sensing said second beam, a coin of the first denomination passing through the first chute intercepting both beams to cause the first and second sensors to signal the passage of a coin of the first denomination, a coin of the second denomination passing through the second chute intercepting the second beam to cause the second sensor to signal the passage of a coin of the second denomination, and a coin of the third denomination passing through the third chute intercepting the first beam to cause the first sensor to signal the passage of a coin of the third denomination.

4,550,820

APPARATUS FOR ORIENTING AND STACKING HOLLOW, FRUSTO-CONICAL CONTAINERS

Robert R. Bishop, 93 Palmdale Dr., Agincourt, Ontario, Canada (M1T 1P2)

Filed Sep. 6, 1983, Ser. No. 529,292
Int. Cl.[4] B65B *25/00*; B65G *57/00*
U.S. Cl. 198—389 **14 Claims**



1. Apparatus for orienting frusto-conical articles having opposite ends of different width, comprising:

downwardly inclined ramp means for receiving said articles in random orientations and allowing said articles to fall along said downwardly inclined ramp means;

means extending transversely of the ramp means and spaced by a gap from the lower end of said ramp means and constituting an abutment for said articles;

said gap being greater than the width of the widest end of said articles and less than the length of said articles;

conveyor means beneath said gap for receiving and conveying said articles;

said conveyor means comprising a pair of conveyor belts extending parallel to said gap and spaced apart by a distance which is greater than the width of the narrowest end of said articles and less than the length of said articles and means for driving said conveyor belts;

said downwardly inclined ramp means having means for displacing upwardly of said ramp means an adjacent portion of any of said articles which bridges said gap, whereby said articles are caused to fall between said conveyor belts with said widest ends thereof uppermost.

4,550,821

CIGARETTE REVERSING APPARATUS

Motonobu Horie; Toshiyasu Hirabayashi, and Hisao Suzuki, all of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,599
Claims priority, application Japan, Dec. 22, 1982, 57-224028
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—416 **8 Claims**

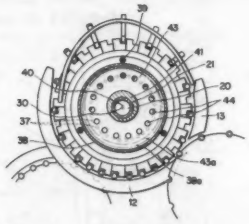
1. A cigarette reversing apparatus comprising

a transfer drum (**4**) rotating in a predetermined direction and having first and second axial ends, said transfer drum having an odd number of slots (**6**) axially extending in a periphery thereof with regular spacings therebetween, said slots each being divided substantially at respective middle points thereof into first and second sections to receive plural pairs of cigarettes in which cigarettes in each pair are aligned butt to butt, said transfer drum having a plurality of air holes (**35**) formed therewithin corresponding in number to the slots in the periphery thereof and having first openings (**33**) in said slots at said respective middle points thereof and second openings (**37**) in the first axial end, said second openings in the first axial end, being circularly arranged in said second axial end at regular spacings therebetween;

feed means for feeding plural pairs of cigarettes to said transfer drum each at an interval two times each of said regular spacings between the slots such that each pair is received in the first and second sections of every other slot in the transfer drum periphery;

take-up means provided downstream of said feed means for taking up cigarettes received in the second sections of the slots at a predetermined take-up position;

reversing means provided between upstream of said take-up means and downstream of said feed means for reversing cigarettes received in the first sections of the slots about said middle points to transfer said cigarettes into the second section;



a rotating disc member (**43**) slidably abutting against said first axial end and having a plurality of communication holes (**4**) axially extending therewithin, said communication holes being circularly arranged at regular angular spacings therebetween, each angular spacing between two adjacent communication holes being two times each angular spacing between two adjacent second openings (**37**) of the air holes (**35**) in the transfer drum, said rotating disc member rotating about a center eccentric from the center of the transfer drum to bring the communication holes into alignment with every other second opening only at an angular area where said reversing means extends, said every other second opening communicating with the slots in which the cigarettes are being reversed; and

vacuum source means for providing vacuum to said communication holes.

4,550,822

APPARATUS FOR TRANSPORTING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS ARRIVING IN AN IMBRICATED FORMATION

Jacques Meier, Büretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 28, 1983, Ser. No. 470,590
Claims priority, application Switzerland, Mar. 11, 1982, 1491/82
Int. Cl.[4] B65G *47/31*
U.S. Cl. 198—461 **13 Claims**

1. An apparatus for transporting flat products, especially printed products, arriving in an imbricated product formation, comprising:

feeding means for infeeding the products at a predetermined feeding velocity in a predetermined product feeding direction and defining a product feeding path;

conveying means arranged upstream of said feeding means with respect to said predetermined product feeding direction and operated at a conveying velocity which is smaller than said predetermined feeding velocity of said feeding means, said feeding means and conveying means being substantially coplanar;

continuously driven accelerating means arranged to act

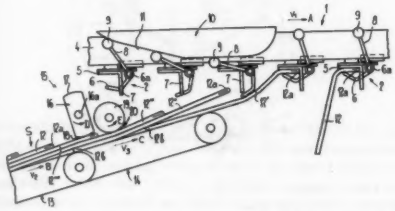
periodically upon said products supported by said conveying means in order to accelerate said products;

transport means for transporting the products at a predetermined transporting velocity in a product transport direction;

said transport direction extending in the same general direction as said feeding direction;

said feeding means supplying said products to said transport means;

individually controllable gripper units arranged at said transport means in spaced relationship from each other and movable along a predetermined travel path;



each gripper unit serving to take-over the products supplied thereto and to engage at least one of said products supplied thereto at a leading edge thereof for further transport of such engaged product;

a product transfer region defined by said feeding means and by said transport means;

said feeding path of said products supplied by said feeding means forming an acute angle with said travel path of said gripper units; and

said feeding velocity of said feeding means being greater than said transporting velocity of said transport means.

4,550,823

AIR FILM SUPPORTED ENDLESS BELT CONVEYOR SYSTEM

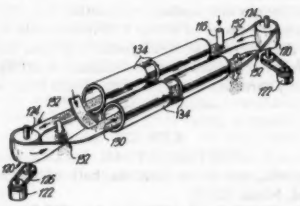
Herbert E. Gladish, Ottawa, Canada, assignor to E. B. Eddy Forest Products, Ltd., Ottawa, Canada

Division of Ser. No. 947,435, Oct. 2, 1978, Pat. No. 4,489,825. This application Oct. 10, 1984, Ser. No. 659,523

Claims priority, application Canada, Oct. 19, 1977, 288996

Int. Cl.⁴ B65G *15/60*

U.S. Cl. 198—805 **12 Claims**



1. An endless belt conveyor system comprising at least one elongated conveyor air tube having means for projecting a thin film of supporting air into a lower portion of the interior thereof; an endless belt extending through said tube, said belt comprising a generally tubular outer member formed of a resilient, deformable material, a deformable metallic core extending generally axially within said member, and a resilient, flexible deformable filler material substantially filling the space between said core and said member, said belt being deformable upon load application to form upper and lower surfaces, the lower surface being convex and being complementary to said lower portion of said tube, said upper surface being concave and adapted to receive a load; and means for driving said belt in an endless loop.

4,550,824

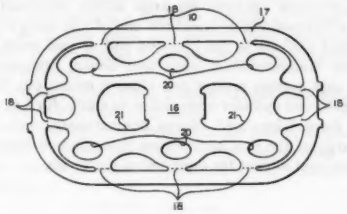
BOTTLE CARRIER

Roger R. Rhoads, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 530,566, Sep. 9, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,188

Int. Cl.⁴ B65D *71/02, 85/62*

U.S. Cl. 206—150 **15 Claims**



10. A bottle package comprising

a plurality of bottles having a body portion and a neck portion and a closure which is crimped around the neck of the bottle and forms a concave fillet at the juncture with the container,

a carrier comprising a generally flat blank formed of a material that is flexible and elastic,

said blank having a central portion with a plurality of openings receiving the neck of the containers and engaging the containers at the juncture of the closure fillet and the container,

each said opening having a configuration of a substantially isometric 36° ellipse, the ratio of the major axis to the minor axis being between 0.5 and 0.65 and the ratio of the perimeter of the greatest side wall dimension of the closure to the perimeter of the opening ranging between 1.25 and 1.40.

4,550,825

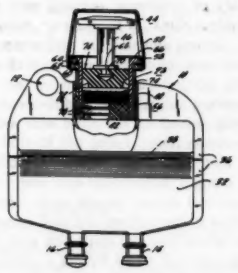
MULTICOMPARTMENT MEDICAMENT CONTAINER

Caroll S. Sutryn, Montoursville, and Michael G. Maietta, Cogan Station, both of Pa., assignors to The West Company, Phoenixville, Pa.

Filed Jul. 27, 1983, Ser. No. 517,579

Int. Cl.⁴ B65D *3/04*

U.S. Cl. 206—222 **6 Claims**



1. A multicompartment medicament container comprising a dry medicament compartment and a liquid diluent compartment, said compartments being discrete and separately selec-

tively filled respectively with a dry medicament and a liquid diluent, said compartments being separately respectively inspectable for determining contents and conditions therein, said compartments being superposedly joined and thereby constituting a multicompartment container, said dry medicament compartment including a double open ended cylinder consisting of an inner glass material cylinder inert to said dry medicament and an outer plastic material cylinder, said plastic outer cylinder attached by sealing in an opening in said liquid diluent compartment and thereby forming said multicompartment medicament container assembly, a slidably removable bottom sealing and closure means in said inner glass cylinder, and plunger means operable for axial sliding movement therein from a first position adjacent one end of said inner cylinder to a second position at the opposite end of said inner cylinder directly communicating with said diluent compartment to expel said bottom sealing and closure means out through a bottom of said cylinder open end as an entity, for free displacement thereof into said diluent compartment, and complete discharge of the dry medicament through said bottom open end into said diluent for intermixing therewith.

4,550,826

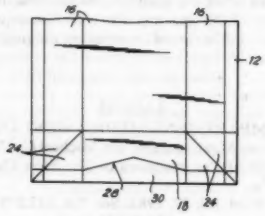
SEMI-RIGID CONTAINER WITH A BOTTOM OF IMPROVED STABILITY

Mari Asanuma, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Feb. 17, 1984, Ser. No. 581,356

Int. Cl.[4] A24F *15/00*; B65D *85/10*

U.S. Cl. 206—259 **24 Claims**



1. A laminate web of semi-rigid material, the web comprising a plurality of prescored regions, each of the prescored regions defining a blank for forming a container with a bottom of improved flatness and stability and comprising:

first, second and third adjacent side wall portions, the first side wall portion being joined to the second side wall portion along a crease line and the second side wall portion being joined to the third side wall portion along another crease line;

a bottom end wall panel joined to the second side wall portion along a third crease line; and

first and second corner panels each joined by respective crease lines to the bottom end wall panel and to a respective one of the first and third side wall portions;

the bottom end wall panel having a substantially V-shaped crease line which extends from a first point, adjacent to the first corner panel, toward the second side wall portion to a second point and from the second point away from the second side wall portion to a third point adjacent to the second corner panel.

4,550,827

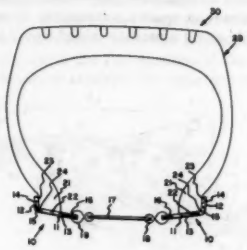
TIRE PACKAGING

George T. Watts, North Canton, and Theron J. Thaden, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 487,431, Apr. 21, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,222

Int. Cl.[4] B65D *85/06*

U.S. Cl. 206—304 **4 Claims**



1. A tire package having an axis of rotation and comprising:

a. an uninflated tire having a pair of annular bead portions, each said bead portion having a radially inner surface of a predetermined axial width that is oriented at a predetermined angle of between about 5° and about 15° with respect to said axis, each said bead portion further comprising an axially outer surface extending in a generally radial direction, projections of the radially inner and axially outer surfaces of said bead portions intersecting one another at the sharp diameter of the bead portions;

b. a pair of annular plastic bead protectors, each of said bead protectors being slideably inserted inside a bead portion of said tire, each said bead protector comprising an annular bead seat with a generally radially extending flange located at the axially outermost end of the bead seat with respect to said tire package, the bead seat of each bead protector having a radially outer surface that is adjacent to the radially inner surface of a bead portion of said tire with the flange having an axially inner surface that is adjacent to the axially outer surface of the bead portion of the tire, the radially outer surface of the bead seat of each bead protector being oriented at substantially the same angle with respect to said axis as the radially inner surfaces of the bead portions of said tire, projections of the radially outer surfaces of said bead seats and axially inner surfaces of said flanges intersecting one another at a sharp diameter that is in the range of 0.0 to 3.75 millimeters less than the sharp diameter of the bead portions of said tire; and

c. a plurality of elastic tension members exerting an axially inwardly directed force on each of said bead protectors.

4,550,828

PORTABLE TOOL BOX

Arthur Baldwin, and Mark Baldwin, both of 105 Market St., Rockland, Mass. 02370

Filed Feb. 22, 1985, Ser. No. 704,541

Int. Cl.[4] A43C *11/26*; B65D *5/38, 5/46, 5/48*

U.S. Cl. 206—349 **9 Claims**

1. A portable tool box comprising:

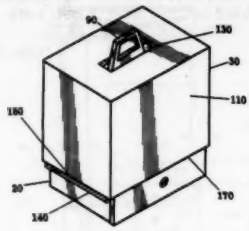
an open-top housing having a housing bottom wall connected to a pair of opposed housing sidewalls and a pair of opposed housing endwalls, one of said housing endwalls having an aperture for a drawer, and one or more of said housing walls including an outwardly projecting shelf;

a drawer slidably engageable within said aperture, said drawer including a face having a lip extending above the shelf;

means disposed above said drawer aperture having a plural-

ity of apertures for holding tools in an upright position above said drawer;

an open-bottom cover having a cover top wall connected to a pair of opposed cover sidewalls and a pair of opposed cover endwalls, each of said pair of cover sidewalls and



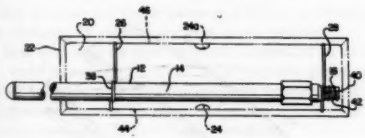
endwalls being spaced apart a distance sufficient for slidable engagement over said housing and into engagement with said shelf, said lip being covered by one of said cover endwalls when the cover is slidably engaged over the housing with the shelf, said shelf being disposed below the top of the lip.

4,550,829

SPRING CLIP FOR PUSH BROOM

Martin P. Strahs, Lawrenceville, N.J., assignor to Quickie Manufacturing Corporation, Cinnaminson, N.J.

Filed Dec. 23, 1983, Ser. No. 565,107
Int. Cl.⁴ B25G *3/12*
U.S. Cl. 206—361 **8 Claims**



1. A spring clip for a push broom of the type comprising a separable, elongate cylindrical handle and a brush head including a rigid base having a transverse width and a height and a longitudinal axis comprising

a unitary length of wire, the wire being bent to define a first web portion, a transversely aligned second web portion and an integral loop therebetween, the second web portion being of greater length than the first web portion,

the loop being in frictional engagement with the handle;

a pair of first and second legs respectively extending from the first and second web portions and terminating in respective free ends, the free ends being normally spaced apart by a distance that is less than the width of the bsse, the legs terminating at their free ends in bent feet, the feet being adapted to engage bottom portions of the rigid base, and

the length of the legs being substantially equal to the height of the base;

whereby the handle can be secured in side-by-side relationship to the base in parallel offset relationship to the said longitudinal axis by inserting the handle through the loop and by engaging the base with the feet and legs of the clip.

4. A storage assembly for a push broom of the type comprising a separable handle having an elongated, cylindrical body, the handle having a threaded end, and a brush head including a rigid base having a transverse width, a longitudinal axis and a fixed height comprising

a first bent wire clip means to releasably secure the handle to the said base in side-by-side relationship,

the first clip means having a first web and a first leg portion,

the first web including a first circular loop, the first loop having a diameter suitable to tightly engage the handle threaded end, the first loop encircling a portion of the threaded end and being threadedly engaged thereon,

the first leg portion being adapted to span the height of the base and to secure to the base; and

a second bent wire clip means to releasably secure the handle to the base in side by side relationship,

the second clip means having a second web and a second leg portion,

the second web including a second circular loop, the second loop having a diameter suitable to tightly engage the handle body, the second loop encircling a portion of the handle body and being frictionally engaged thereon,

the second leg portion being adapted to span the height of the base and to secure the base,

the first leg portion being secured to the base in longitudinal spaced relationship from the first leg portion;

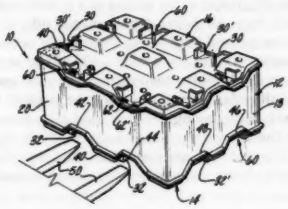
whereby the handle is releasably secured to the base in two spaced locations.

4,550,830

PALLETIZED CONTAINER

Lyle Shuert, 817 N. Fieldstone, Rochester, Mich. 48063

Continuation of Ser. No. 442,350, Nov. 11, 1984. This application Oct. 19, 1984, Ser. No. 662,548
Int. Cl.⁴ B65D *19/18*
U.S. Cl. 206—386 **23 Claims**



1. A container (10) comprising:

a reusable pallet (14) having a plurality of slots (62) extending vertically through the pallet at spaced locations about its periphery with each slot opening at its upper end in the upper face of the pallet and opening at its lower end in a first portion of the lower face of the pallet; and a sleeve (12) having a plurality of tabs (32) formed at spaced locations along its lower edge foldable about vertical fold lines (38) and aligned with said slots (62) so that said tabs may be passed downwardly through the upper ends of said slots to a position in which the upper edges of the tabs are generally aligned with said lower face first portions whereafter the tabs may be folded inwardly underneath the pallet to juxtapose the upper edges of the tabs to said lower face first portions, with the tabs essentially perpendicular to the plane of the pallet, to thereby secure the sleeve to the pallet.

4,550,831

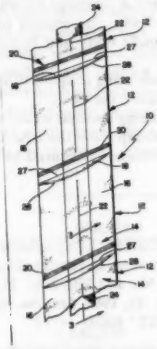
STRIP OF DETACHABLY CONNECTED BAGS FOR MEDICAL SUPPLIES

Alan Whitford, North Scituate, R.I., assignor to Superior Plastic Products Corp., Cumberland, R.I.

Filed Apr. 9, 1984, Ser. No. 598,181
Int. Cl.⁴ B65D *33/22*
U.S. Cl. 206—439 **2 Claims**

1. An elongated strip of connected bags for medical supplies

and the like comprising a plurality of substantially identical bags, each of said bags comprising a substantially flattened, two-sided seamless tubular wall portion made of a flexxible plastic material which is sealed at one end thereof and open at the opposite end thereof, the seal at the sealed end of each of said bags being formed between the two sides of said wall portion thereof without other layers of plastic material therebetween, said wall portion of each bag having a substantially longitudinally extending slit therein which extends along one side thereof from a point spaced from the open end thereof to a point spaced from the sealed end thereof and a longitudinally extending detachable strip which extends along the exterior of



said wall portion for covering said slit and which is sealingly secured to said wall portion adjacent said slit and adjacent the end of said slit closest to the sealed end of said wall portion, the slits in said bags all being on the same side of said strip of connected bags, said bags being detachably connected in end-to-end relation so that the sealed ends of the wall portions of said bags are detachably connected to the open ends of the wall portons of the next bags along only the sides of the wall portons of said bags through which said slits extend to permit access to the interiors of said bags through the open ends thereof while said bags are connected, said detachable strips on said bags also being detachably connected in end-to-end relation.

4,550,832

STACKABLE BOX WITH ADJUSTABLE COVER

Otfried Traumüller, and Gerd Weinberg, both of Oberstenfeld, Fed. Rep. of Germany, assignors to Furnier -u. Sperrholzwerk and J. F. Werz Jr. KG Werzalit-Pressholzwerk, both of Oberstenfeld, Fed. Rep. of Germany

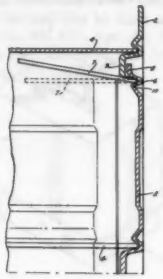
Filed Apr. 30, 1980, Ser. No. 145,057

Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920431

Int. Cl.[4] B65D *6/24, 21/02*

U.S. Cl. 206—509 **6 Claims**

1. A box, particularly a stackable box, comprising a frame of a substantially right-angled shape with four adjacent walls of non-flowable moldable material and each having an outwardly extending angular portion, the angular portions of adjacent walls being secured to each other, and forming outwardly extending corners of the box, said frame having a lower inwardly and downwardly extending portion and an upper portion; a cover, which may be inserted into said frame in either a substantially horizontal position or in a position inclined to the horizontal; and a horizontal base inserted into said frame at a lower edge thereof and located above said lower portion, at least two of said walls being formed with a groove provided at an upper portion of each of the two walls to receive said cover for closing an upper end of said box, said groove each having a depth which is suficient to engage said cover when the latter is in either of said positions, said upper portion having a web upwardly extending from said groove, said web being adapted to engage the lower portion of the frame of a successive up-



wardly positioned box in a stack to form a locking connection therewith.

4,550,833

VARIABLE-VOLUME RECEPTACLE, ESPECIALLY FOR USE AS A COMPENSATING RECEPTACLE IN BUILDING HEATING SYSTEMS

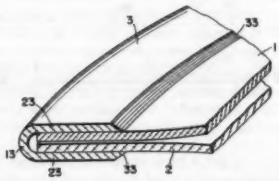
Peter Hoheisel, and Peter Bartholmei, both of Northeim, Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,507

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313853

Int. Cl.[4] F22B *35/00;* **F28F** *27/00;* **B65D** *85/00*

U.S. Cl. 206—527 **4 Claims**



1. A variable-volume receptacle adapted for use as a compensating receptacle in building heating systems, in the form of a substantially flat bladder, said receptacle comprising:

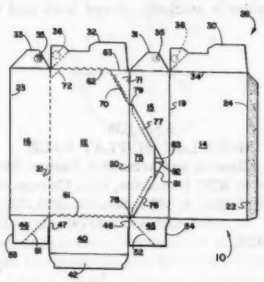
two flexible sheets of elastomeric material, said sheets having the same surface area, and being disposed loosely against one another, with their peripheral edges being substantially flush, to form said bladder; said sheets, when disposed against one another, having respective outer surfaces which are directed away from one another; and

an edge strip of elastomeric material for continuously sealingly interconnecting said sheets along said peripheral edges thereof; said edge strip has an essentially U-shaped cross-section, with two parallel side pieces and a curved portion which interconnects said side pieces; said side pieces each have an inner surface directed toward one another and respectively adhesively connected to respective ones of said outer surfaces of said sheets to effect said continuous sealing interconnection thereof, the thickness of at least said side pieces of said edge strip being approximately the same as the thickness of said sheets; said curved portion of said edge strip being guided around and spaced from said peripheral edges of said sheets, which are movable relative to one another; the material of said edge strip being at least similar to, though harder than, that of said sheets.

4,550,834
SELF-ERECTING END-LOAD TOP-DISPENSING CONTAINER

Richard J. Fletcher, Wilmington, Del., and Henry Wischusen, III, Lilburn, Ga., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del. and Rock-Tenn Co., Norcross, Ga.

Filed Dec. 5, 1983, Ser. No. 558,030
Int. Cl.[4] B65D *17/28, 17/40*
U.S. Cl. 206—611 9 Claims



1. A cut and scored blank for a self-erecting, end-loading, top-dispensing container, said container being convertible from a substantially flattened configuration for shipping the empty containers into an erected box-like configuration for loading product into the container and for shipping loaded containers, said container being further convertible into a tray having an open top for dispensing product, comprising:

a substantially rectangular first panel member;

a first side wall member hingedly connected at a first transverse score line to one edge of said first panel member;

a second side wall member hingedly connected at a second transverse score line to the edge of said first panel member opposite said first side wall member;

a substantially rectangular second panel member hingedly connected at a third transverse score line to said first side wall member;

glue flap means hingedly connected at a fourth transverse score line to permit securing said second panel member to said second side wall member;

an end wall flap hingedly connected at a longitudinal score line to said first panel member and including a tuck flap for inserting into the assembled container to form an openable and closable product insertion end wall opening;

tear score means for removing a substantial portion of said first panel member to define an open-topped tray for dispensing product carried within the container;

first web connecting means joining said end wall flap to said first side wall member;

second web connecting means joining said end wall flap to said second side wall member;

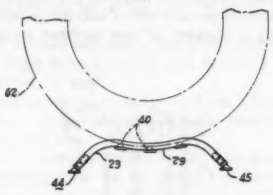
each of said web connecting means including a score line extending outwardly from the intersection of said end wall flap and said side wall member for folding said web connecting means when said end wall flap in closed; and

interlocking flap means hingedly attached at a longitudinal score on the side of the blank opposite said end wall flap and defining an automatic end closure which assumes a disassembled flattened configuration when the container is in its flattened configuration and which automatically interlocks to form an assembled end wall for the container when the container is caused to assume its erected configuration.

4,550,835
TIRE CHANGING RACK

India M. Lynch, 14170 Painesville-Warren Rd., Painesville, Ohio 44077

Filed Jul. 30, 1984, Ser. No. 635,712
Int. Cl.[4] A47F *7/04*
U.S. Cl. 211—24 5 Claims



1. A tire changing rack including in combination first and second spaced and generally U-shaped bar brace members of tubular construction each having first and second end portions and an intermediate portion therebetween, said intermediate portion of each said bar brace member having a slight U-shape in a direction opposite to said generally U-shaped configuration of said bar brace members, a plurality of spaced bearing strips each having first and second end portions secured respectively to said first and second bar brace members at said intermediate portions, a plurality of caster ball bearings mounted on an upper surface of each of said bearing strips and located in a position to engage the surface of a tire to be handled by said rack, first and second leg brace members located respectively at said first and second end portions of said bar brace members, each said leg brace member comprising a flat plate member for flatly engaging the ground adjacent a vehicle tire to be changed and having first and second end portions, a tubular member secured to and extending upwardly and at an acute angle from said first and second end portions of each of said flat plate members, each said tubular member being of a size to fit within said tubular construction of said bar brace member and each having a laterally extending spring biased pin, a plurality of laterally extending and axially spaced openings in said first and second end portions of each of said bar brace members, said tubular members residing in respective ones of said end portions of said first and second bar brace members with a spring biased pin of said tubular members residing in a lateral opening in a said end portion of said bar brace member.

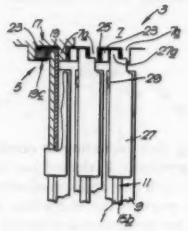
4,550,836
CLAMP ARRANGEMENTS

Stafford M. Ellis, West Sussex, England, assignor to Marconi Avionics Limited, England

Filed Mar. 20, 1984, Ser. No. 591,582
Claims priority, application United Kingdom, Apr. 5, 1983, 8309170
Int. Cl.[4] H05K *7/14*
U.S. Cl. 211—41 9 Claims

1. A clamp arrangement comprising a board and a mechanism for clamping a marginal portion of the board adjacent an edge between two opposed substantially flat parallel walls, the mechanism being mounted on a major surface of the board adjacent said edge and being capable of expansion in a direction normal to said major surface and toward one of said flat parallel walls, said arrangement including: an elongate resilient element extending in the direction of its length along said marginal portion of said board and having corrugations transverse to its length, means for substantially non-slidably securing said resilient element to said board, said element by virtue of said corrugations spaced from and adjacent said major surface of the board adjacent said edge; and an elongate rigid cam having a longitudinal axis extending along the length of said resilient element and overlying said resilient element on

the side of said element opposite from the side facing said major surface of the board; said resilient element and said cam being arranged such that in operation of the mechanism contact between the resilient element and the cam causes said expansion of the element toward said one of said flat parallel walls, and on limitation of expansion, compression of the corrugations in the resilient element and resulting pressure by said resilient element against the marginal portion of the board to force the board against said one of said flat parallel walls; said cam including a plurality of cam surfaces along its length,



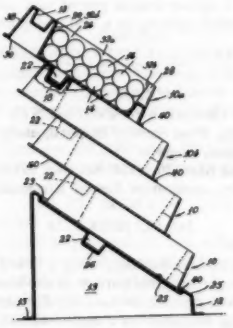
spaced apart by substantially the pitch of said corrugations in said resilient element; wherein the improvement includes means mounting said cam for sliding movement relative to said resilient element in the direction of the length of said resilient element between a position in which said cam surfaces are disaligned from those corrugations which are spaced from the board to a position wherein the cam surfaces engage the corrugations spaced from the major surface of the board in which latter position the cam surfaces effect the aforesaid expansion of said mechanism.

4,550,837

STACKABLE SHIPPING AND DISPLAY CONTAINER

Richard J. Simmons, Carol Stream, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Aug. 2, 1982, Ser. No. 404,588
Int. Cl.[4] A47F *3/14*
U.S. Cl. 211—126 **10 Claims**



1. A container for nesting together with other similar containers when empty and adapted to be stackably tiered when used for dispensing articles contained therein, comprising:

a container having a plurality of sidewalls defining a compartment for containing said articles, each said sidewall having a draft angle for nesting with empty compartments of said similar containers, and an opening through which said articles can be dispensed;

first engaging stacking means integral with said container, being hollow and having peripherally enclosed sidewalls with a draft angle for nesting with hollow first engaging stacking means of said similar containers;

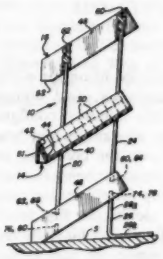
second engaging stacking means integral with said container, being hollow and having peripherally enclosed sidewalls with a draft angle for nesting with hollow second engaging stacking means of said similar containers, said first and second engaging stacking means are located so as to be removed from and independent of the sidewalls of said compartment, and wherein said second engaging stacking means of said container is engageable with a first engaging stacking means of said similar containers when said container is stackably tiered with said similar container.

4,550,838

MODULAR DISPLAY RACK

Walter Nathan, Glencoe, and Armand S. Zucker, Skokie, both of Ill., assignors to RTC Industries, Inc., Chicago, Ill.

Filed Mar. 5, 1984, Ser. No. 586,222
Int. Cl.[4] A47F *3/14*
U.S. Cl. 211—128 **14 Claims**



1. In a knock-down, multi-tiered article storage and display rack, wherein article storage and shipping trays are assembled into multi-tiered upright displays, the tiers being vertically separated by spacers, for placement on a horizontal support surface, the improvement comprising, in combination:

a plurality of said article storage and shipping trays disposed in inclined display positions for goods adapted to be packaged and shipped in said trays, said trays each including a substantially rectangular base and three adjacent upright retaining walls connected to and extending transversely above the base along the front and two side edges of the base, the height of said walls being selected to provide lateral restraint for packaged goods packed in and on the tray, each of said trays being adapted for being positioned in a horizontal storage position or an inclined display position;

each of said trays also including display panel means secured to an upper portion of the front one of the three upright walls, said display panel means being inclined outwardly and downwardly from said upright tray wall to a level spaced above a projection of the plane of the lowermost side of the base, forming with the front edge of the base, a front horizontal support means for the tray; and

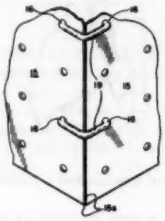
base means selectively connected to and operatively associated with a portion of the lowermost of said trays distally of said front horizontal support means for the tray for maintaining the tray at said inclined display position when the tray is positioned on a substantially horizontal support surface, and the front horizontal support means on said lowermost tray being coplanar with the lower extremity of said base means.

4,550,839

DISPLAY SYSTEM

Jack E. Good, Salt Lake County, Utah, assignor to Grant Larsen and Marian Larsen, both of Salt Lake City, Utah, a part interest to each

Filed Sep. 28, 1982, Ser. No. 426,123
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—189 **14 Claims**



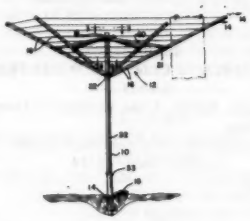
1. A display system comprising a plurality of triangular shaped display panels, said display panels to fit together in edge to edge configuration, a number of said display panels so fitted together to enclose an area forming a freestanding structure, each display panel including uniformly spaced-apart perforations formed therein; and clip means for maintaining said display panels in edge to edge engagement, each clip means consisting of a clip formed from a straight section of rigid material of an appropriate diameter at the ends to fit within the panel perforations and is formed into a U-shape to have essentially parallel legs that extend from a web that is bent at a normal angle to said legs to rest against the surfaces of the joined display panels, said leg ends to fit in said perforations in each of the aligned panels, the clip means to extend across the junction of said abutting panels.

4,550,840

CLOTHES DRYING DEVICE

Aad Van Deursen, 2400 E. Devon, Suite 260, Des Plaines, Ill. 60018

Filed Feb. 16, 1984, Ser. No. 580,651
Int. Cl.[4] A47F *5/04, 5/10*
U.S. Cl. 211—197 **10 Claims**



1. A portable household device which can be easily stored and carried by an individual when in a folded position, and, which is moveable to an unfolded, operable position for use as a clothes dryer and umbrella, the improvement comprising:

a ground mounted mast having a bottom in the ground and having a top and being adapted to be secured in an upright position;

a spider mechanism;

said spider mechanism including a top collar and a bottom collar, each collar being attached to said mast and spaced thereapart, each collar having adjustment and locking means for selectively securing and also varying the position of each collar on said mast;

a plurality of support arms extending from said bottom collar and having a pivotal attachment with the bottom collar for swinging motion between a substantially vertical position adjacent said mast when stored to an operational position;

cable means extending between and connecting said support arms;

said support arms having a plurality of openings with plastic ferrules providing smooth passageways for said cable means to thereby allow the cable to move easily therethrough

said plastic ferrules including a first insert portion having an integral head formed therein and having a hooked end spaced from the head;

a lock ring located about the hooked end adjacent the support arm to capture the ferrule in the associated opening of the support arm;

a plurality of connecting links having one end attached to and extending from the top collar and having a pivotal attachment connection with the top collar to provide swinging movement of said links between a first position adjacent the mast when the device is folded, to a second position away form the mast when the device is unfolded, said connecting links having a second end with a pivotal attachment with an associated support arm; and

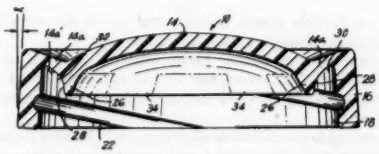
said top and bottom collars having mast gripping means being adjustable to unlock to allow movement of said collars on said mast for selectively positioning the spider mechanism and said mast whereby the spider may be positioned with said support arms extending upwardly and outwardly of said mast and thereby placing said connecting links in a state of tension, and said collars capable of being reversed on said mast whereby said support arms extend downwardly and outwardly of said mast and said connecting links are placed in a state of compression and the device can also be utilized with cover means as said umbrella and a clothes dryer.

4,550,841

CLOSURE HAVING INTEGRAL FORMED SEALING MEANS

Jeffrey Sandhaus, Rte. 9W, Snedens Landing, N.Y. 10964

Continuation-in-part of Ser. No. 441,546, Nov. 15, 1982, Pat. No. 4,479,585, which is a continuation-in-part of Ser. No. 399,237, Jul. 19, 1982, Pat. No. 4,442,945, which is a continuation-in-part of Ser. No. 335,216, Dec. 28, 1981, Pat. No. 4,413,742. This application Nov. 7, 1983, Ser. No. 549,477
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—211 **10 Claims**



1. In a closure adapted to be applied to an open end region of a container having a top wall and outer and inner sidewalls to close the same, the closure including a top and an integral skirt depending from a peripheral edge region of said top, said skirt having an inner sidewall adapted to fit over the outer sidewall of the container, the improvement comprising:

inner engagement sealing means integral with and extending from said closure top, said engagement sealing means having an outer sealing surface portion spaced radially inwardly from said skirt inner sidewall to at least partially define a space therebetween for receiving at least a portion of the open end region of the container;

means for outwardly expanding said engagement sealing means during application of the closure to the container to

urge said outer sealing surface portion thereof against the inner sidewall of the open end region of the container, said expanding means including a central non-planar region of said closure top having an outer periphery at which said central non-planar top region joins said engagement sealing means and an outer region of said closure top extending between said inner engagement sealing means and said closure skirt, said outer closure top region having a downwardly facing surface adapted to engage said container top wall during application of the closure to the container so as to be deformed upon such engagement,

said outer closure top region, inner engagement sealing means and central non-planar region of said closure top constituting a mechanism whereby engagement of said downwardly facing surface of said outer closure top region causes said central non-planar top region to flex towards a more planar configuration to thereby urge said outer sealing surface portion of said inner engagement sealing means against the inner sidewall of the open end region of the container,

whereby a hermetic sealing of the container by the closure is obtained.

4,550,842

FLEXIBLE PLASTIC STERILE CLOSURE SYSTEM FOR CONTAINERS

Robert Cummings, Richardson, Tex., assignor to U.S. Clinical Products, Inc., Richardson, Tex.

Continuation of Ser. No. 294,331, Aug. 19, 1981, Pat. No. 4,390,104. This application Dec. 27, 1982, Ser. No. 453,215

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.[4] B65D *41/32, 51/20*

U.S. Cl. 215—232 **18 Claims**

1. A flexible plastic multilayered cover for resealing an intravenous solution container, comprising:

a first layer of flexible plastic material forming an upper surface of the cover, said first layer being formed from a material substantially impermeable to moisture and bacteria;

a second layer of flexible plastic material bonded to said first layer of plastic material, said second layer having an orientated plastic film with a tensile strength in the direction normal to the direction the cover is pulled in removing it from a container greater than the tensile strength parallel to the direction of removal;

an area of adhesive material bonded to the surface of said second layer for adhering to the top of an IV solution container to reseal the IV solution container; and

an adhesive free region of said second layer for aligning with the port of the container resealed by the cover, whereby the sterility of the covered portion of the IV solution container is retained by placing the sealing cover on the portion of the container top to be resealed and said second layer of material promotes separation of the cover upon its removal to leave a telltale mark that the sterile closure has been broken while fully exposing the port of the container.

4,550,843

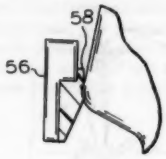
BOTTLE CAPS

Robert L. Nolan, New York, N.Y., assignor to Maxcap, Inc., New York, N.Y.

Filed Dec. 14, 1982, Ser. No. 449,783

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 **17 Claims**



1. A combination of a bottle and a molded plastic cap therefore,

said bottle having a neck carrying an outwardly extending thread and having an outwardly extending shoulder beneath said thread,

said cap comprising a top wall, an annular sidewall extending down from said top wall and having an inwardly extending thread for cooperation with said neck thread, and an integral antitamper skirt connected to said side wall,

said skirt having at least a lower portion which, when the cap is fully screwed onto said neck, is at a level below said shoulder, said skirt having also an integral inwardly projecting flap which is integrally hinged thereto and which as molded projects inwardly, the construction and arrangement being such that

(a) when, during the operation of screwing said cap onto said neck, said cap moves downward, said flap is engaged by said shoulder and pushed upward and outward thereby and then, on further downward movement of said cap during said operation, said flap is moved past said shoulder and

(b) when, during the operation of unscrewing said cap from said neck, said cap moves upward, said flap engages the lower part of said shoulder and is forced by said engagement downward and outward into abutting relationship with said lower portion of said skirt so that the presence of said flap decreases the effective internal diameter of said lower portion of said skirt so as to prevent said skirt, while intact, from passing up over said shoulder.

4,550,844

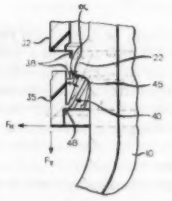
TAMPER RESISTANT CLOSURE WITH TEAR-OFF BAND

Michael A. Lininger, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 22, 1984, Ser. No. 623,659

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 **16 Claims**



1. A closure for a finish of a container having a neck ring, the closure comprising a cap and an annular tamper resistant band

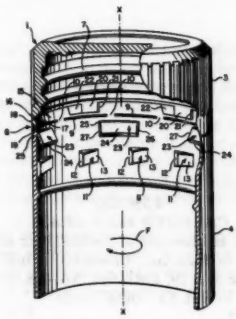
member connected to the bottom of the cap with a series of frangible break-away bridges that attach the tamper resistant band member to the cap, the member comprising an annular band integral with the bridges and a lower wedge-shaped glass-finish contacting member that bends upwardly like a fishhook when the cap is applied to the finish, the outer end portion of the contacting member being wider and thicker than the portion nearer the band for greater contact of the end portion against the neck ring of the glass finish.

4,550,845

BOTTLE CLOSURE

Piergiacomo Guala, Alessandria, Italy, assignor to Angelo Guala S.p.A., Alessandria, Italy

Filed Feb. 22, 1985, Ser. No. 704,505
Claims priority, application Italy, Feb. 24, 1984, 19789 A/84
Int. Cl.⁴ B65D *41/34*
U.S. Cl. 215—252 **3 Claims**



1. Bottle closure of the kind comprising an internally threaded cap, a collar extending coaxially with and in continuation of the cap and having internal axial teeth and an internal circumferential ridge, and means defining a line of weakness between the cap and the collar

wherein the improvement consists in:

the closure is made in a single piece,

the cap is formed internally, in proximity to the line of weakness, with a circumferential recess having a sawtooth cross-section and defining in the cap an annular portion of trapezoidal section, and

a plurality of tabs projecting internally from the collar arranged circumferentially in proximity to the line of weakness, said tabs engaging in said recess to serve as a bridge across the line of weakness.

4,550,846

NON-STICK STOPPER WITH EASY REMOVAL STRUCTURE

Edwin D. Phillips, 700 Cedar Ave., Middlesex, N.J. 08846

Filed Apr. 3, 1984, Ser. No. 596,383
Int. Cl.⁴ B65D *39/04*
U.S. Cl. 215—296 **9 Claims**

1. A stopper device comprising: a one-piece unit having means for efficient sealing with a bottle without danger of breaking same including an upper portion and a bottle neck engaging lower portion;

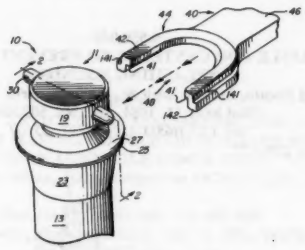
means with said lower portion for forming a flexible sealing surface of such a configuration that said sealing surface is not in substantial compression;

said flexible sealing surface being on a wall portion of substantially uniform thickness without any slits, slots, ribs, valleys, or the like; and

further means provided with said upper portion for permitting easy removal of the device from a bottle neck device when desired; and

further including a stopper removal tool having a substantially U-shaped engaging recess at one end thereof and a handle portion at the other end thereof for manipulation by a user, and said tool having means so it can be used with different styles of stoppers;

said means so the tool can be used with different styles of stoppers includes the U-shaped recess of the tool defining



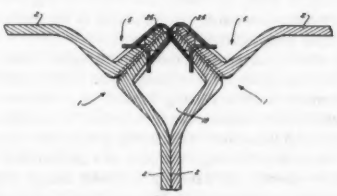
two spaced tines with each tine in cross-section having double angles back to back to each other so that an inner portion of said U-shaped stopper engaging will have a recessed area completely therearound and each of the outer surfaces of the respective tines of the U-shaped portion will have complementary recesses extending longitudinally therealong.

4,550,847

STACKABLE BOX

Otfried Traümuller, and Gerd Weinberg, both of Oberstenfeld, Fed. Rep. of Germany, assignors to Furnier- u. Sperrholzwerk and J. F. Werz Jr. KG Werzalit-Pressholzwerk, both of Oberstenfeld, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,056
Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920430
Int. Cl.⁴ B65D *6/24*
U.S. Cl. 220—4 F **7 Claims**



1. A stackable box, comprising a frame having four walls made from non-flowable moldable material and being of substantially right-angled shape, said walls having angularly extending portions which, upon assembling of two neighboring walls form a corner of said frame, a base inserted into a lower edge of said frame, and a cover inserted into an upper edge of said frame to close the box, said angularly extending portion of each wall forming with a remaining portion of said wall a rectangularly-shaped notch, said notch extending along the entire height of said box, said remaining portion of said wall being formed with at least one inwardly extending projection, each said wall being formed with a first longitudinal groove provided at a lower edge thereof and with a second longitudinal groove provided at an upper edge thereof, said base in assembly being positioned within the respective first longitudinal grooves of the assembled walls and said cover being positioned within the respective second longitudinal grooves of the assembled walls; and means to connect the attached ones of

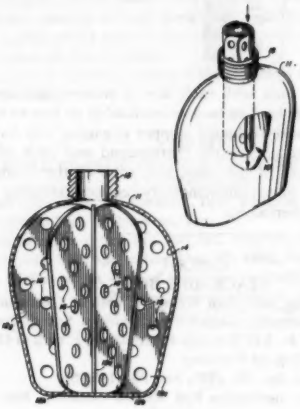
said angularly extending portions of said walls to each other, each of said walls being further provided in the area of said inwardly extending projection with an opening so that the projections of two neighboring walls of two adjacent boxes placed in a horizontal row and said openings therein form ventilation channels for circulation fresh air through the boxes.

4,550,848

BAFFLE FOR CANTEENS TO PREVENT LIQUID SPLASHING SOUNDS

Edward Sucato, 3102 N. 24th St., Phoenix, Ariz. 85016

Filed May 11, 1984, Ser. No. 609,304
Int. Cl.[4] B65D *1/04, 5/48, 25/04*
U.S. Cl. 220—22 **4 Claims**



1. An elongated baffle for canteens to prevent liquid splashing sounds comprising:

a plurality of damping members connected together to extend radially outwardly of the center of the baffle and all arranged longitudinal of its length,

at least one of said damping members being provided with at least one aperture for providing liquid flow therethrough,

said damping members being formed of a resilient plastic material which members may be coiled in the same direction around the center of the baffle so that the coiled baffle may be inserted through the neck of a canteen and into its interior wherein the damping members uncoil with their edges frictionally engaging the inside walls of the canteen in a spaced arrangement.

4,550,849

REFUSE CONTAINER

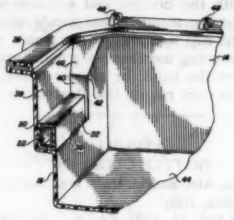
Gordon H. Adsit, Lake Wales, Fla., assignor to Industrial Refuse Sales, Inc., Lakeland, Fla.

Filed Apr. 15, 1985, Ser. No. 723,339
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—71 **18 Claims**

1. In a refuse container having a substantially rectangular shaped molded plastic body defined by first and second opposed end walls, a front wall, a rear wall and a bottom, the improvement comprising:

an extension formed in each of said end walls, said extension forming a stepped indentation in each of said end walls protruding outwardly of said container;

first and second metal sleeves, said sleeves being attached to a corresponding one of said end walls at said stepped indentation inside said container; and



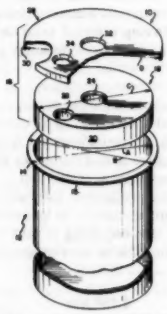
an opening formed in each of said extensions whereby said container may be lifted by arms inserted into said sleeves.

4,550,850

CANISTER ROLL SEAM

Dwight D. Smith, and Leonard J. Cranfill, both of Connersville, Ind., assignors to Stant Inc., Connersville, Ind.

Filed Sep. 29, 1982, Ser. No. 428,188
Int. Cl.[4] D06F *75/26*
U.S. Cl. 220—253 **8 Claims**



1. In a metal container having a generally continuous wall of fixed perimeter and at least one open end, an end plate for the open end comprising

a stiffening means having sufficient strength to withstand a radially inwardly directed force exerted by a roller against the continuous wall during a seam-forming operation, the stiffening means having a perimetrical surface disposed conformably adjacent to and interiorly of the generally continuous wall,

a cover portion disposed exteriorly of the stiffening means, the cover portion having a perimeter greater than the perimeter of the container,

at least one opening in the cover portion,

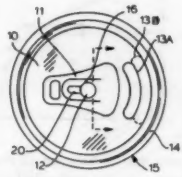
an outwardly disposed peripheral lip on the continuous wall, the peripheral lip having an outer perimeter less than the perimeter of the cover portion, and

a rolled seam for coupling the peripheral lip to the cover portion.

4,550,851
CONTAINER TOP OPENING MEANS

Ernest R. Garrett, 17054 Chatsworth St., Granada Hills, Calif. 91344, and Charles A. Chambers, Burbank, Calif., assignors to Ernest R. Garrett, Granada Hills, Calif.

Filed Jan. 16, 1984, Ser. No. 570,974
Int. Cl.[4] B65D *17/42*
U.S. Cl. 220—277 **8 Claims**



1. A container top and consumer removable seal for beverage containers comprising: a container top including an arcuate shaped opening in the peripheral region thereof between a pair of parallel arcuate edges defining a relatively uniform width beverage opening, said container top being in substantially permanent sealed relationship with the container; and

removable means for closing said arcuate shaped opening;

said arcuate shaped opening having a length of between ½ and 1¼ inch in length and in the order of 5 times the width thereof;

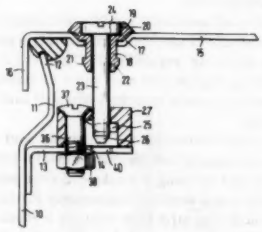
whereby said arcuate shaped opening provides a thin sheet of beverage to the mouth and tongue of the person consuming a beverage from the container and provision for entrance of air into the container during drinking of the beverage; and

wherein the tongue of the consumer is exposed to minimum temperature extremes from the beverage contained in the container thereby avoiding desensitizing the taste buds on the tongue.

4,550,852
SWITCH BOX AND CLOSURE THEREFOR

Jürgen Laudt, Herborn, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,646
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 8332164[U]
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—327 **18 Claims**

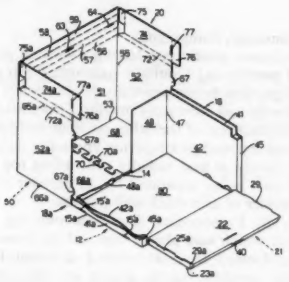


1. A switch box comprising a box-like lower compartment formed by walls (10) having a locking upper edge (12) and a cover (15) with downwardly turned edges (16) which fastens over the opening of said lower compartment, and is provided in the area of at least two of its corners with mounting flanges (13) for connecting screws (36) which can be screwed into threaded bores (14) on said mounting flanges positioned in the interior upper corners of said lower compartment, characterized by a locking element (27) with bore (30) for connector (23) having a locking means and fastened to said cover (15), fastened on said flanges (13), said locking means only insertable in and removable from said bore (30) in said locking element (27) in a single, predetermined angular position to retain said connector in an axially non-displaceable manner in said bore (30).

4,550,853
BLANK ARTICLE FOR ASSEMBLING INTO A CONTAINER HAVING DOUBLE OR BOX-LIKE WALLS, AND AN OPENABLE HINGE WALL

Giorgio Grati, Milan, Italy, assignor to OGRAD s.r.l., Milan, Italy

Filed Jan. 13, 1983, Ser. No. 457,568
Claims priority, application Italy, Jan. 14, 1982, 20474/82[U]
Int. Cl.[4] B65D *5/22, 5/58*
U.S. Cl. 220—416 **7 Claims**



1. A blank article for forming a container, said blank article comprising a bottom panel, two side sections extending from said bottom panel, two side creaselines each being defined between said bottom panel and one of said two side sections, a front section extending from said bottom panel, a front creaseline defined between said front section and said bottom panel, a rear upper section extending from said bottom panel, a rear creaseline defined between said rear upper section and said bottom panel, each of said two side sections comprising a first side panel, a second side panel foldable in a box-like fashion on said first side panel, and a first spacing band located therebetween, said rear upper section comprising a rear panel bounded from the bottom panel by said rear creaseline, and an upper panel extending from said rear panel, an upper creaseline defined between said upper panel and said rear panel and extending parallel to the rear creaseline, said rear upper section further comprising two third side panels extending from the sides of the upper panel, two rear side creaselines defined between each third side panel and said upper panel, a plurality of second bands extending from the end of the upper panel located opposite to the upper creaseline, band creaselines bounding each of said plurality of second bands, said plurality of second bands being foldable in rib-like fashion along said band creaselines, said front section comprising successively from said front creaseline a first front panel, a third spacing band, a second front panel, said second front panel being foldable on said first front panel and being spaced apart by said third spacing band, a front box-like, door-like wall being formed by said first front panel, said third spacing band and said second front panel when the container is assembled, said bottom panel being separated from said wall by said front creaseline and said wall being hingedly pivotable about said front creaseline.

4,550,854

DEEP-DRAWN CONICAL PLASTIC CONTAINER AND METHOD OF MAKING

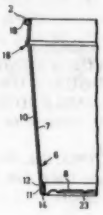
Walter Schellenberg, Diepoldsau, Switzerland, assignor to Sandherr Packungen AG, Switzerland

Filed Aug. 9, 1983, Ser. No. 521,599

Claims priority, application Switzerland, Aug. 10, 1982, 4792/82

Int. Cl.⁴ B65D *90/02, 3/22*

U.S. Cl. 220—468 **14 Claims**



1. A container, comprising:

a deep-drawn plastic cup having a bottom portion, a main wall portion and a radially protruding top rim, said main wall portion being generally frustoconical and tapering upwardly and outwardly, having a thickness less than half of the thickness of the other portions and having a frustoconical top wall part tapering upwardly and inwardly and terminating at said radially protruding top rim, said top wall part being separated by an annular ridge from the remainder of said main wall portion;

a generally frustoconical sleeve surrounding said cup and within which said plastic cup is deep-drawn, said sleeve being formed from a material different from and not readily weldable to the plastic of said cup, said sleeve being shaped and dimensioned to surround, tightly engage and reinforce said main wall portion, said sleeve including a frustoconical top section tapering upwardly and inwardly with said top wall part of said plastic cup, and a frustoconical lower section tapering downwardly and inwardly with said main wall portion below said top wall part; and

said cup further including a radial outward protrusion around said bottom portion so that said sleeve is axially confined between said radial protrusion and said top rim so that the axially facing edges of said sleeve are covered thereby.

4,550,855

MOIST TISSUE SOFT PACK DISPENSERS

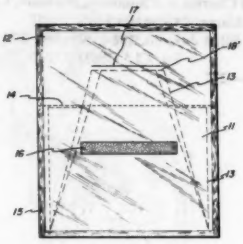
Thomas S. Harrison, Deer Isle, Me., assignor to Sterling Drug Inc., New York, N.Y.

Filed Sep. 14, 1983, Ser. No. 528,752

Int. Cl.⁴ B65H *1/00*

U.S. Cl. 221—63 **8 Claims**

1. A moist towelette dispenser package containing a supply of moist towelettes in a continuous zig-zag folded web and separated by perforations, wherein said package comprises an envelope having a towelette holding portion and a closure flap portion separated from one another by a transverse fold line, said envelope being formed from an upper and a lower sheet of flexible, moisture-impervious material, said sheets being of the same overall outer dimensions and sealed to one another around the outer edges thereof, said upper sheet having an adhesive area affixed thereto, said upper sheet being further provided with a dispensing opening positioned on said flap portion, said dispensing opening and adhesive area being located generally equidistant from said fold line so that when said flap portion is folded over said towelette holding portion along said fold line, said opening is completely sealed by said adhesive area against said towelette holding portion and wherein said perforations in said folded web serve to provide means for separation of each towelette from the supply thereof



so that, on withdrawal and separation of each towelette, the end of the next towelette in said web is left entirely within said envelope package.

4,550,856

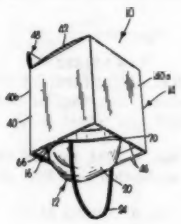
FACE MASK AND DISPENSER ASSEMBLY

Fred A. Ballmann, 12051 W. 100th St., Lenexa, Kans. 66215, and James M. Cooper, 6011 W. 61st Ter., Shawnee Mission, Kans. 66202

Filed Feb. 29, 1984, Ser. No. 584,742

Int. Cl.⁴ B65H *1/00*

U.S. Cl. 221—63 **12 Claims**



1. In combination:

a plurality of interfitted cuplike face masks, each mask having a certain cross-section presenting a generally parabolic nose-receiving region and a generally circular mouth-receiving region, and each mask including a strap secured adjacent opposite marginal edges of said mouth-receiving portion;

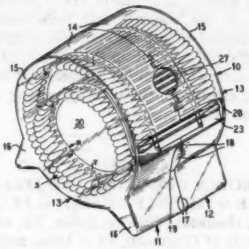
an elongated container for receiving said interfitted masks and comprising continuous sidewalls circumscribing said masks and defining a mask-receiving passageway; and

retaining means secured transversely across said passageway and including structure defining a mask-dispensing aperture of the same general cross-sectional configuration as said mask cross-section, said masks being disposed in said passageway adjacent said retaining means with the strap of the one mask adjoining said retaining means extending through said aperture such that said masks are serially dispensed by pulling on the strap of said one mask, said one mask being removed from said container with the remaining masks being retained in said container and the strap of the next mask exposed in said aperture.

4,550,857
COTTON SWAB VENDER

J. Fred Castner, Sr., P.O. Box 7156, San Diego, Calif. 92107, and John F. Castner, Jr., 7572 Volga Dr. #1, Huntington Beach, Calif. 92647

Filed Jan. 10, 1984, Ser. No. 569,771
Int. Cl.[4] B65H 5/28
U.S. Cl. 221—70 10 Claims

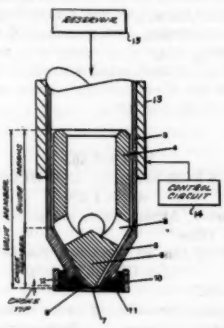


1. A refillable vender for cotton swabs releasably carried cross-wise on an elongated flexible tape wound about itself forming a roll with a leading end which comprises a casing composed of a plurality of mating components, means releasably securing said components together in mated relation to define a chamber with an arcuate top wall receiving said roll for rotation about a horizontal axis with a peripheral wall surrounding the roll and having an open ended arcuate chute with an outer wall defined by said arcuate top wall of the chamber and an inner wall in spaced parallel relation therewith receiving and supporting the leading end at the top of the roll at one end and discharging said leading end of the roll at a lower level at the other end, an exposed support lip extending downwardly and outwardly beyond the discharge end of the chute across the full width of the chute, a finger hole in the arcuate top wall providing for advancing the tape and swabs through the chute to the lip, and a cutting edge on the arcuate top wall above the lip for severing an exposed length of tape.

4,550,858
TIMED-DISPENSING METHOD AND APPARATUS

Pieter J. Noomen, Utrecht, Netherlands, assignor to Dowe Egberts Koninklijke Tabaksfabrier Koffiebranderijen Theehandel N.V., Utrecht, Netherlands

Filed Dec. 23, 1982, Ser. No. 452,861
Claims priority, application Netherlands, Dec. 31, 1981, 8105936
Int. Cl.[4] B67D 5/42
U.S. Cl. 222—1 4 Claims

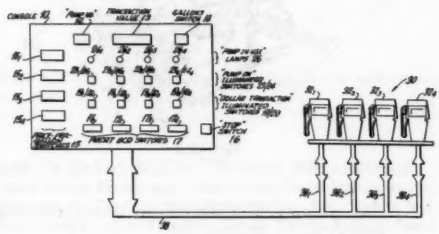


1. A method of dispensing a consumption unit of liquid beverage concentrate of high and variable viscosity and having a pre-determined volume in a beverage dispensing machine, in which, for each quantity dispensed, a valve is opened for a specific period of time and the beverage concentrate issues under a constant static pressure, characterized in that each consumption unit is dispensed in a pulsating manner at a frequency of at least five pulsations per second by opening and closing said valve a pre-determined number of times to dispense a volume of liquid which is substantially independent of variations in viscosity.

4,550,859
MICROPROCESSOR CONTROLLED FLUID DISPENSING SYSTEM

John Dow, Jr., Rumson; William A. Oetting, Green Brook, and Richard J. Yessian, Martinsville, all of N.J., assignors to Lockheed Electronics Company, Inc., Plainfield, N.J.

Filed Jan. 29, 1979, Ser. No. 7,512
Int. Cl.[4] B67D 5/06
U.S. Cl. 222—26 6 Claims



1. In combination in a fluid dispensing system, a microprocessor including plural latched input-output ports, a program storing read only memory and a read and write variable memory connected to said microprocessor, plural pump means, plural interface circuit means and first bus means connecting each of said pump means with at least a first one of said microprocessor ports, console means, and further address and data bus means connecting said console means with further of said microprocessor input-output ports, each said pump means including reset switch means and dispensed fluid metering means communicating to said first one of said microprocessor input-output ports via an associated one of said interface circuit means and pump motor selective energizing means controlled by said microprocessor through said associated interface circuit means, said console means including plural pump enabling switch means and display means each connected by said further address and data bus means with said further input-output ports of said microprocessor.

4,550,860
PLANTER POPULATION REDUCTION DRIVE UNIT

Ralph E. Weeder, Box 83, Lindsay, Nebr. 68644

Filed Jul. 30, 1981, Ser. No. 288,642
Int. Cl.[4] A01C 19/00
U.S. Cl. 222—615 4 Claims

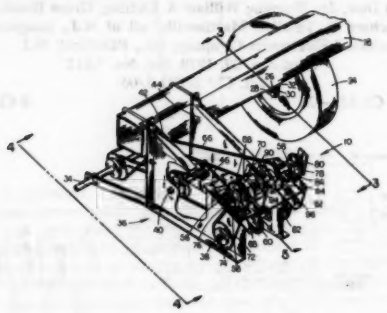
1. In an agricultural planter implement having an elongated tool bar and a plurality of individual planter units and a plurality of ground wheels connected to the tool bar, a population reduction drive system comprising,

first and second shafts rotatably mounted on the implement in spaced-apart relation,

means operatively connecting said second shaft to the planter units for operating said units in response to rotation of the second shaft,

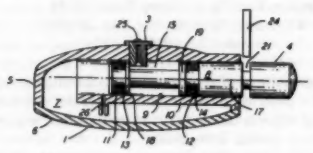
a plurality of sprockets of various sizes carried on said first and second shafts for rotation therewith,

a chain trained about a selected pair of said sprockets for setting the population rate corresponding to that pair,
a third shaft rotatably mounted on the implement and having a fixed sprocket secured thereon,
chain drive means operatively connected to said fixed sprocket and ground wheels for rotating said third shaft in response to rotation of said ground wheels,
a primary chain drive connection between said third and first shafts including
a remotely actuated wrap spring clutch mounted on said third shaft,
a primary drive sprocket connected to said wrap spring clutch for rotation with said third shaft when said wrap spring clutch is engaged,
a primary driven sprocket on said first shaft, and



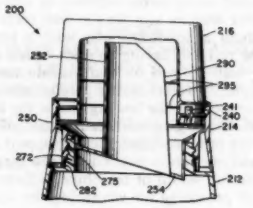
a chain trained around said primary drive sprocket and primary driven sprocket, and
a secondary chain drive connection between said third and first shafts including,
an over running clutch mounted on said third shaft, a secondary drive sprocket connected to said over running clutch for rotating said third shaft when said wrap spring clutch is disengaged,
a secondary driven sprocket on said first shaft, and
a chain trained about said secondary drive sprocket and secondary driven sprocket,
said wrap spring clutch including a solenoid operatively connected thereto for disengaging said wrap spring clutch in response to actuation of said solenoid and for engaging said wrap spring clutch in response to deactuation of said solenoid.

4,550,861
LACHRYMATOR/DYE DISPENSER
James P. Fay, Sr., and James P. Fay, Jr., both of Keene, N.H., assignors to Pro-Tex Limited Partnership, Keene, N.H.
Filed Sep. 2, 1983, Ser. No. 529,321
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—78 **7 Claims**



1. A dispenser for dispensing a dye and a lachrymator, comprising a housing defining a closed cavity, an open ended bore extending from the cavity to the exterior of the housing, said bore having an orifice located in its sidewall in communication with said cavity, a spool valve defining a longitudinal axis, disposed in the bore and moveable between open and closed positions, a nozzle extending from the bore to the exterior of the housing, said spool valve with said bore defining a chamber with which said nozzle communicates, said spool valve sealingly engaging said bore, when in the closed position, on both sides of said chamber, to exclude communication between said chamber and the cavity and, when in the open position, said orifice permitting communication of said chamber with the cavity whereby when a lachrymator under pressure is present in the interior of the housing, said lachrymator will pass through said chamber to and through said nozzle, and means for opening said spool valve from the exterior of the housing, differential pressure when present between the inferior of the housing and the exterior of the housing serving to move said spool valve to its closed position.

4,550,862
LIQUID PRODUCT POURING AND MEASURING PACKAGE WITH SELF DRAINING FEATURE
Dale E. Barker, Hamilton; Griscom Bettle, III, and Robert H. Van Coney, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 442,381, Nov. 17, 1982. This application Oct. 28, 1983, Ser. No. 545,579
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—109 **11 Claims**

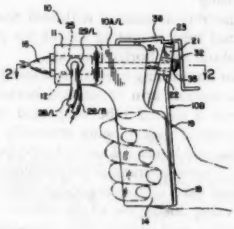


1. An improved package for liquids comprising:
(a) a container for housing a liquid and having an upwardly extending finish provided with a dispensing orifice;
(b) a transition collar mounted on the exterior of said container finish, said collar having an outwardly projecting pouring spout, a circumscribing wall with fastening means formed on its interior surface, said spout extending above and being spaced from said circumscribing wall to insure maximum dispensing and mess control and drain means for returning spilled liquid to said container; and
(c) a measuring cup adapted to serve as a closure, said measuring cup having an open mouth terminating in an anti-drip lip and having fastening means formed on its external surface surrounding said mouth, said external fastening means being adapted to cooperate with the fastening means on said transition collar to attach the measuring cup on the interior of said transition collar with the measuring cup in inverted condition.

4,550,863
FOAM GUN FOR MIXING AND DISPENSING TWO REACTANTS
Merlyn F. Farrey, Akron, Ohio, assignor to Fomo Products, Inc., Akron, Ohio
Filed Jun. 27, 1983, Ser. No. 507,973
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—145 **1 Claim**

1. A dispensing gun adapted to be connected to separate pressurized fluid components for the supply of foam reactants, comprising: a body component having an upper barrel with a longitudinal bore and a pistol grip below the barrel, said barrel

having a rear wall with an opening coaxial with said bore, said barrel further having an upper rear portion carrying a rearwardly directed resilient lock member, said pistol grip having opposed rearwardly directed flanges defining a vertical slot for housing a squeezable trigger; a trigger component having a rearwardly projecting lower portion, a medial portion pivotally mounted at the upper end of said pistol grip vertical slot and an upper portion alignable with said rear wall of the barrel said upper portion having a safety lock flange; a reactant supply and mixing component positioned adjacent the front end of said barrel bore and having a sleeve with a plurality of ports for the supply of foam reactants, each said supply port extending through a coupling stud for connection thereof to length of



flexible tubing extending to a remote container for a foam reactant; a reciprocating valve rod component positioned coaxially within said opening in said rear wall of the barrel for connection to said upper portion of the trigger component, the front end of said rod carrying an elongate valve element having an outer diameter coincident with the inner diameter of said sleeve so as to open or close said supply ports and to purge said sleeve of foam reactants; there further being bias means to urge said valve element into said sleeve to normally close said supply ports while purging said sleeve and to move said lower trigger portion rearwardly of said pistol grip, said lock member on said barrel being normally positioned to engage said safety lock flange on said trigger component when said valve element is positioned to close said supply ports.

4,550,864

LEAK-PROOF DISPENSING CONTAINER

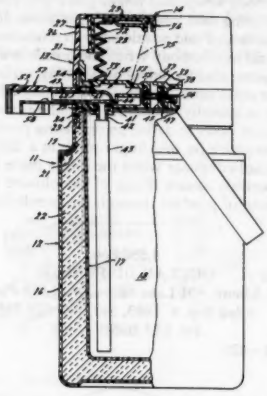
R. A. Tarozzi, Gales Ferry, and C. Formhals, Ledyard, both of Conn., assignors to King-Seeley Thermos Co., Norwich, Conn.

Filed Aug. 27, 1980, Ser. No. 181,730

Int. Cl.⁴ B67D *5/42*

U.S. Cl. 222—209 **8 Claims**

1. In a dispensing container having a body portion defining a cavity for containing a liquid, pump means carried by said body portion, said pump means having an outlet port in communication with said cavity for generating a pressure upon the liquid therein upon operation of said pump means, dispensing means for delivering liquid from said cavity upon actuation of said pump means, valve means movable between a closed position, an intermediate position and an opened position, a releasable stop means for releasably and positively restraining said valve means in its intermediate position, said valve means being effective to close communication of said outlet port with said cavity and prevent liquid passage through said dispensing means when said valve means is in its closed position, and venting means for venting the area over the liquid in said container to the atmosphere at a restricted rate when said valve means is in its intermediate position for precluding accidental



leakage of fluid due to pressure build-up when said valve means is moved to its open position.

4,550,865

OBLIQUELY-HANDLING NOZZLE FOR AEROSOL

Katsumi Hirao, Osaka, and Akira Sasaki, Nara, both of Japan, assignors to Toyo Aerosol Industry Co., Ltd., Tokyo and Kanpe Katei Toryoo Kabushiki Kaisha, Osaka, both of, Japan

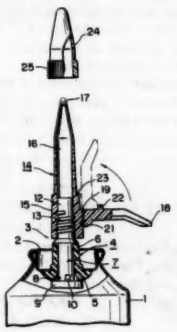
PCT No. PCT/JP82/00478, § 371 Date Aug. 25, 1983, § 102(e) Date Aug. 25, 1983

PCT Filed Dec. 24, 1982, Ser. No. 530,589

Claims priority, application Japan, Dec. 25, 1981, 56-193841[U]

Int. Cl.⁴ B05B *9/04*

U.S. Cl. 222—402.21 **3 Claims**



1. A discharge nozzle for an aerosol container having a discharge opening with a closure including a stem, the closure operable upon tilting of the stem relative to the discharge opening to provide a discharge path from the interior of the container to the closure, said nozzle comprising:

(a) an elongated nozzle body including means to removably secure said body to said closure, said body being generally tubular to provide a product discharge path, the outer surface of said tubular body including an engagement portion;

(b) an elongated finger piece extending laterally outwardly from said tubular body and secured thereto by a thin

foldable web that defines a hinge, said finger piece including engagement means spaced outwardly from said web and engageable with said engagement portion of said nozzle body when said finger piece is pivoted about said web to bring said elongated finger piece adjacent to the outer surface of said nozzle body to retain said finger piece along said nozzle body when the nozzle is not in use, said finger piece also including an abutting surface adapted to abut the outer surface of said nozzle body when said finger piece is in laterally outwardly extending relationship with said nozzle body to define an operating position, whereby finger pressure on said finger piece in a direction toward the aerosol container when the finger piece is in the operating position causes tilting of the closure to permit the dispensing of product through the nozzle body.

4,550,866

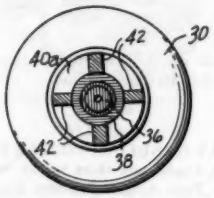
OCULAR DISPENSER

Lawrence F. Moore, 501 Lake Shore Dr., Lake Park, Fla. 33403

Filed Sep. 6, 1983, Ser. No. 529,395

Int. Cl.⁴ B05B *11/04*

U.S. Cl. 222—420 **4 Claims**



1. In combination with a container containing medicine, a closure therefor comprising a body having a fluid passageway therethrough in communication with the interior of the container, said body including:

(a) a lower portion adapted to be partially received with said container;

(b) a nozzle portion being generally circular in cross-section at any point and comprising a first upper portion of a first color different from the color of the container and a second lower portion of a second color different from the color of the container; and

(c) an intermediate flange portion having a planar surface of a third color and a plurality of radially outwardly extending ridges protruding upwardly from said planar surface, said ridges being of a fourth color.

4,550,867

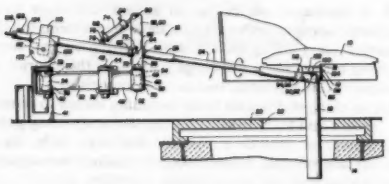
SHROUD TUBE MANIPULATING AND SUPPORTING APPARATUS

John R. Bell, Edwardsville; Robert E. Scoville, and Joade Whitt, both of Granite City, all of Ill., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1983, Ser. No. 541,931

Int. Cl.⁴ B22D *41/08*

U.S. Cl. 222—607 **5 Claims**



1. In an apparatus for positioning and supporting a shroud tube for use in a metal teeming operation in which molten metal is poured from a bottom opening of a teeming vessel into a receiving vessel positioned beneath the bottom opening, the apparatus including a boom assembly having one end mounted on a rigid structure for pivotal movement about a vertical axis and being articulated intermediate its end to permit universal movement of its other end in a horizontal plane, an elongated shroud tube support arm, and means mounting the support arm intermediate its ends on the universally movable end of the boom assembly for movement therewith, for limited pivotal movement about a horizontal axis, and for limited rotational movement about its longitudinal axis, a bifurcated yoke at one end of the support arm for engaging and supporting a shroud tube, and drive means at the other end of said support arm for rotating the support arm about its longitudinal axis, the improvement comprising

power means operably associated with said boom assembly and said shroud tube mounting means for pivoting said support arm about said horizontal axis,

control means for controlling operation of said power means to rotate said support arm about said horizontal axis to raise and lower a shroud tube supported on said yoke means, said control means being manually operable to selectively raise and lower the shroud tube for positioning relative to the bottom opening in the teeming vessel and to urge the shroud tube into engagement with the teeming vessel outlet valve during use of the shroud tube,

said means mounting said support arm comprising a bracket pivotally mounted on and projecting upwardly from the universally movable end portion of said boom assembly for movement therewith and for free pivotal movement about a vertical axis, said bracket including means journaling said support arm for pivotal movement about a horizontal axis spaced above said boom, and

said means mounting said support arm for rotation about its longitudinal axis comprising an elongated sleeve telescopingly receiving one end portion of said support arm, said sleeve including trunnion means engaging said bracket for supporting said sleeve and said support arm for said pivotal movement about said horizontal axis.

4,550,868

METHOD AND APPARATUS FOR TRANSFERRING HOSIERY BETWEEN HOSIERY MANUFACTURING MACHINES

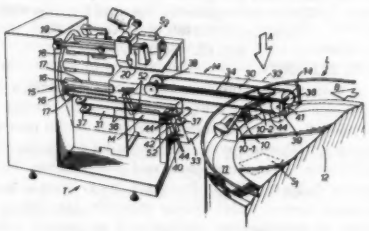
Michael J. Hodges, and Malcolm K. Scanes, both of High Wycombe, England, assignors to Detexomat Machinery Ltd., Buckinghamshire, England

Filed Feb. 3, 1984, Ser. No. 576,548

Claims priority, application United Kingdom, Feb. 4, 1983, 8303159

Int. Cl.⁴ D05B *33/00*; D06G *3/04*

U.S. Cl. 223—43 **26 Claims**



1. Hosiery manufacturing equipment including first and second spaced apart hose support means aligned with respect to each other, and a transfer means which strips hose from said first support means, carries same to said second support means

and loads said hose thereon, said transfer means including endless conveyor means located between said first and second hose support means, said endless conveyor means having at least one hose holding means secured thereto and being movable therewith, said hose holding means including a set of hose gripping fingers, a portion of said conveyor means being positioned adjacent said first support means so that said fingers make engagement with the welt end of hose supported thereat and strip said hose from said support, after which said transfer means deliver said hose to said second support means and places said welt end of said hose in an encircling relationship on said second support means in a predetermined attitude with respect thereto.

4,550,869

DOUBLY ELASTIC CUSHIONED CARRYING STRAP

Joyce E. Johnson, 631 E. Washington, Pontiac, Ill. 61764

Filed Feb. 8, 1984, Ser. No. 578,017
Int. Cl.[4] A61F *5/40*
U.S. Cl. 224—202 **2 Claims**

1. A cushioned carrying strap having a user-contacting, load bearing portion intermediate the ends thereof which is cushioned and elastic primarily in a longitudinal direction, said load-bearing portion comprising:

a plurality of individual elastic blocks of elastic cushioning material linearly disposed in a closely-adjacent, nearly abutting relationship;

a tube of non-stretchable, flexible material snugly enclosing said blocks;

said tube being disposed intermediate the ends of the hand and subject to tension applied at opposite ends of the band and to transverse loads when tensioned about a user's shoulder;

said tube having laterally extending accordion-like pleats between adjacent blocks, the tube normally having a bulge extending laterally outward of the tube in opposite directions at each location of a pleat, the bulges each containing a continuation of the pleat; and

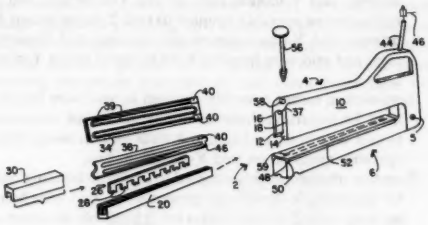
connecting means drawing opposite sides of said tube together at each end of each elastic block to maintain the accordion-like pleats between adjacent blocks and hold the blocks in discrete, closely adjacent positions lengthwise of the tube thereby enabling two-way elasticity resulting from substantial elastic stretch of the tube by unfolding said pleats concurrently with elastic deformation transverse to the tube in response to tension applied to the ends of the tube.

4,550,870

STAPLING DEVICE

John F. Krumme, Woodside, and Darel E. Hodgson, Palo Alto, both of Calif., assignors to Alchemia Ltd. Partnership, Palo Alto, Calif.

Filed Oct. 13, 1983, Ser. No. 541,546
Int. Cl.[4] A61B *17/04*
U.S. Cl. 227—19 **21 Claims**



1. A stapling device including

a first member having staple receiving means for carrying staples therein,

means for driving the staples for causing them to pierce material to be stapled,

said means for driving comprising a driving member deformed into a partially collapsed shape and upon application of heat being recoverable to an expanded shape,

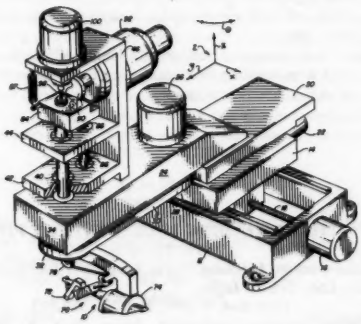
said means for driving being located in said first member between said staples and an opposing inner surface of said first member and further comprising means for heating said deformed member.

4,550,871

FOUR-MOTION WIRE BONDER

Lo K. Chan; Yui K. Tang, and Jui Chang, all of Hong Kong, Hong Kong, assignors to ASM Assembly Automation Ltd., Hong Kong, Hong Kong

Filed Aug. 24, 1982, Ser. No. 410,943
Int. Cl.[4] B23K *37/02;* **H01L** *21/607*
U.S. Cl. 228—4.5 **4 Claims**



1. An apparatus for wire bonding supported on a base, comprising:

a wire bonding head;

X-motion means operably coupled to said wire bonding head for imparting X-directional movement to said wire bonding head, said X-motion means including an X-motion table slidably mounted on said base, X-screw means operably coupled to said X-motion table for moving said X-motion table in the X-direction, and X-motor means operably coupled to said X-screw means for driving said X-

screw means and causing said X-motion table and said wire bonding head to move in the X-direction;

Y-motion means operably coupled to said wire bonding head for imparting Y-directional movement to said wire bonding head, said Y-motion means including a Y-motion table slidably mounted on said X-motion table, a cantilevered sub-frame operably mounted on said Y-motion table, Y-screw means operably coupled to said Y-motion table for moving said Y-motion table in the Y-direction, and Y-motor means operably coupled to said Y-screw means for driving said Y-screw means and causing said Y-motion table and said wire bonding head to move in the Y-direction;

theta-motion means operably coupled to said wire bonding head for imparting theta-directional rotational movement to said wire bonding head, said theta-motion means being operably mounted on said Y-motion means;

Z-motion means operably coupled to said wire bonding head for imparting Z-directional movement to said wire bonding head, said Z-motion means being operably mounted on said Y-motion means, said Z-motion means including:

(a) a vertical support rigidly fastened to said cantilevered sub-frame, said vertical support having a first horizontal arm at an upper end and at least one other horizontal arm, said at least one other horizontal arm having two apertures therethrough,

(b) an alignment collar having an aperture therethrough, an alignment shaft rigidly fastened to said collar and at least one spring biasing said collar toward said first horizontal arm, said alignment shaft slidably engaging one of said apertures in said at least one other horizontal arm and a first cylindrical bore in said cantilevered sub-frame,

(c) a cylindrical shaft slidably engaging said aperture in said alignment collar, one of said apertures in said at least one other horizontal arm, a second cylindrical bore in said cantilevered sub-frame and said theta-motion means, said cylindrical shaft having a longitudinal cylindrical bore passing therethrough and a mounting plate fastened thereto, said mounting plate being operably coupled to said wire bonding head and having a plurality of lugs slidably engaging said theta-motion means, and

(d) Z-motor means operably coupled to said vertical support and operably engaging said alignment collar for causing said alignment collar, said alignment shaft, said cylindrical shaft and said wire bonding head to move in the Z-direction; and

wire feed means for delivering a length of bonding wire to said wire bonding head, said wire feed means being coupled to said vertical support.

4,550,872

FILLET-WELDING EQUIPMENT FOR PIPE MATERIALS

Yutaka Ohnishi, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,527

Claims priority, application Japan, Dec. 9, 1982, 57-186304[U]

Int. Cl.⁴ B23K *31/06, 37/02, 37/04*

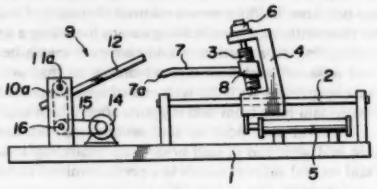
U.S. Cl. 228—48 **4 Claims**

1. A fillet welding equipment for welding pipe materials, the fillet welding equipment comprising:

(a) a movable member adapted to be movable longitudinally of a base body of said welding equipment;

(b) a threaded shaft inclined forwardly and mounted rotatably to said movable member;

(c) a welding torch threadedly connected with said threaded shaft to be movable upwardly or downwardly in a direction of inclination of said threaded shaft; and,



(d) a jig positioned in front of said welding torch to carry members to be welded rotatably mounted on said base body of said welding equipment.

4,550,873

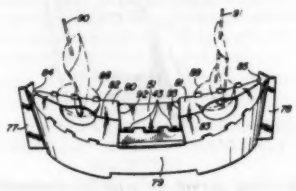
FAST FOOD SERVING TRAY

James W. Fleming, Vancouver, Canada, assignor to Lawson & Jones Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 569,770, Jan. 10, 1984, Pat. No. 4,512,512. This application Apr. 18, 1985, Ser. No. 724,762

Int. Cl.⁴ B65D *5/36*

U.S. Cl. 229—30 **22 Claims**



15. A serving tray for fast food or the like, comprising, in combination,

(a) a pair of generally upright, outwardly convexly curved side walls connected with each other at connection tabs integral with the respective side walls at end sections thereof;

(b) said side walls being further integral with a pair of transverse top walls, each top wall having a parabolic contour in plan, said top walls being disposed one at each end of the tray;

(c) each top wall having a generally circular cutout formed centrally thereof, said generally circular cutouts being of the size adapted to removably receive a frustoconical container such as a plastic coffee cup;

(d) said top walls having inside end edges defining two opposed ends of a generally rectangular central opening adapted to receive a rectangular container such as a hamburger or fish tray, the two remaining opposed sides of said central opening being formed by adjacent sections of the side walls;

(e) a bottom wall formed of two bottom wall sections secured to each other along a longitudinal line, each bottom wall section being integral with the adjacent side wall at a line of weakness extending along a lowermost edge of the respective side wall.

4,550,874

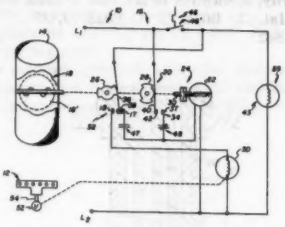
MEANS CONTROLLING A FLUE DAMPER

Michael T. Clouser, Indianapolis, and Robert S. Coulter, Plainfield, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 369,250, Apr. 16, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 580,797

Int. Cl.[4] F23N *3/00*

U.S. Cl. 236—1 G 2 Claims



1. In a heating system wherein heat is supplied from an electrically operable fuel supply source through a conduit;

a flue damper plate rotatably mounted for rotation within said conduit to regulate heat flow through said conduit and a controller controlling the position of said flue damper plate comprising:

(a) a temperature demand means response to a request for heat connected between a junction of a movable contact of a double throw switch and of a relay, and a movable contact of a single pole switch, said single pole switch closed when said flue damper plate is open, and open when said flue damper plate is closed, a first side of said double pole switch closed when said flue damper plate is closed and open when said flue damper plate is open, a second side of said double throw switch open when said flue damper plate is closed and closed when said flue damper plate is open,

(b) said relay including a coil electrically connected between a second side of a power source, and through said temperature demand means to a first side of said power source,

(c) a drive motor coupled to said flue damper plate and electrically connected between said second side of said power source and through a normally closed contact of said relay and through said single pole switch to said first side of said power source, and further connected between said second side of said power source and through a normally open contact of said relay, through a side of said double throw switch, and through said temperature demand means to said first side of said power source, and

(d) said electrically operable fuel supply source connected between said second side of said power source and through a side of said double throw switch and said temperature demand means to said first side of said power source.

4,550,875

ELECTROMAGNETIC UNIT FUEL INJECTOR WITH PISTON ASSIST SOLENOID ACTUATED CONTROL VALVE

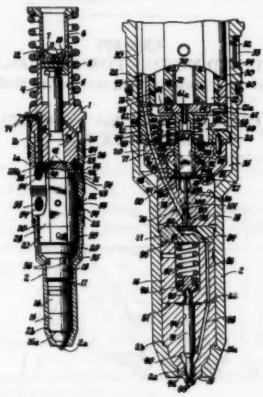
Richard F. Teerman, Wyoming; Russell H. Bosch, Grandville, and Ricky C. Wirth, Alto, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1984, Ser. No. 638,274

Int. Cl.[4] F02M *47/00*

U.S. Cl. 239—88 5 Claims

1. An electromagnetic unit fuel injector includes a housing means having a fuel passage means connectable to a source of fuel for the ingress or egress of fuel at a suitable supply pressure, a supply/drain chamber in flow communication with said fuel passage means, a valve stem guide bore in said housing means with a conical valve seat encircling said guide bore at the supply/drain chamber end thereof; a pump cylinder means in said housing means; an externally actuated plunger reciprocable in said cylinder means to define therewith a pump chamber open at one end for the discharge of fuel during a pump stroke and for fuel intake during a suction stroke of said plunger; a valve controlled injection nozzle means operatively positioned in one end of said housing means; a discharge passage means connecting said pump chamber to said injection nozzle means; a solenoid actuated, poppet valve controlled passage means for effecting flow communication between said pump chamber and said supply/drain chamber and including a solenoid actuated poppet valve having a head with a stem extending therefrom journaled in said valve guide bore for



reciprocable movement whereby said head is movable between an open position and a closed position relative to said valve seat, said stem having a reduced diameter stem portion next adjacent to said head which defines with said valve stem guide bore an annulus portion of said valve controlled passage means; a solenoid means operatively positioned in said housing means, said solenoid means including an armature operatively connected to said poppet valve, a spring means operatively positioned to normally bias said poppet valve to said open position; and a piston slidably journaled in said housing means concentric to said poppet valve with one end of said piston positioned to abut against said head of said poppet valve, the opposite end of said piston being in flow communication with said discharge passage means whereby said piston is operative to assist in holding said poppet valve in said closed position.

4,550,876

SPRINKLER TOY

Ralph J. Kulesza, Chicago; Donald A. Rosenwinkel, Oak Park, and Harry Disko, So. Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 12, 1982, Ser. No. 440,978

Int. Cl.[4] A63H *23/10*

U.S. Cl. 239—211 14 Claims

1. A sprinkler toy comprising:

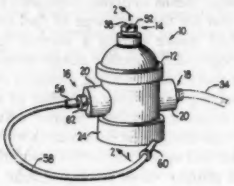
a portable, generally upright cylindrical housing having a top and a bottom;

connector means on said housing for connecting said housing to a garden hose;

upwardly directed diffusing nozzle means, mounted in the top of said housing and capable of fluid communication with said connector means, for spraying liquid outwardly in a diffuse spray from said housing; and

a flexible hose having a connected end and a free exit end

mounted on said housing only at said connected end intermediate said top and bottom and being extendable by the user away from said housing, said hose capable of fluid communication with said connector means.

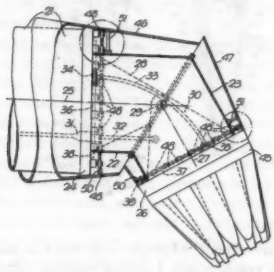


4,550,877

STREAMLINED NOZZLE FOR TURBOMACHINES

Gary F. Szuminski, Marietta, Ga., assignor to Rolls-Royce Inc., New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,905
Int. Cl.[4] F02K 1/78
U.S. Cl. 239—265.35 **5 Claims**



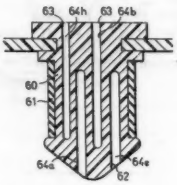
1. A vectorable nozzle for a turbomachine comprising; a first duct; a second duct mounted in a first bearing for rotation relative to the first duct about a longitudinal axis of the second duct, the second duct terminating at a downstream end thereof in a plane inclined relative to a plane normal to said longitudinal axis of said second duct; a third duct mounted in a second bearing and having a longitudinal axis, said third duct being rotatable about said longitudinal axis of said third duct relative to the second duct, the third duct terminating at an upstream end thereof in a plane substantially parallel to the downstream end of the second duct, said downstream end of said second duct and said upstream end of said third duct defining a scarf joint therebetween drive means operable to rotate each the second and third ducts in opposite directions about their respective axes of rotation and operable to cause the second bearing to swing bodily about an axis transverse to the length of the second duct; a first outer fairing encompassing the second duct, the first fairing being mounted relative to the second duct at its upstream end and terminating at its downstream end in a plane substantially parallel to the joint between the second and third ducts; a first constraining means operable to constrain the first fairing against axial movement relative to the second duct; a first connector means interconnecting the first fairing and the second duct whereby rotational movement of the second duct is transmitted to the first fairing to rotate it with the second duct; a second outer fairing encompassing the third duct, the second fairing being mounted relative to the third duct at its downstream end and terminating at its upstream end in a plane substantially parallel to the downstream end of the first fairing; a second constraining means operable to constrain the second fairing against axial movement relative to the third duct; and a second connector means interconnecting the second fairing to the third duct whereby rotational movement of the third duct relative to the second duct is transmitted to the second fairing to rotate it with the third duct.

4,550,878

DRIP IRRIGATOR WITH PRESSURE RESPONSIVE FLOW REGULATOR

Peretz Rosenberg, and Avner Rosenberg, both of Moshav Beit Shearim, Israel

Filed Dec. 6, 1983, Ser. No. 558,432
Claims priority, application Israel, Jan. 7, 1983, 67635
Int. Cl.[4] B05B 15/00; E02B 13/00
U.S. Cl. 239—542 **17 Claims**



1. A flow regulator, comprising: a body member formed with an inlet opening from an edge thereof, an outlet opening from an opposite edge thereof, and a flow passageway interconnecting said openings to produce a flow in a predetermined direction between said openings; and a flexible member overlying said flow passageway so as to meter the flow therethrough in response to the dynamic pressure of the fluid flowing therethrough; the improvement wherein: said flow passageway is defined by at least two grooves formed in spaced parallel relation in said body member, which grooves are separated by a separator wall for a major portion of their length, one of said grooves being an inlet groove leading from said inlet opening at its respective edge of the body member and terminating short of the opposite edge, said inlet groove having a length transverse to said fluid flow direction which is substantially greater than its width parallel to said fluid flow direction; the other of said grooves being an outlet groove leading from said outlet opening at its respective edge of the body member and terminating short of the opposite edge, said outlet groove being parallel to said inlet groove and also having a length transverse to said fluid flow direction which is substantially greater than its width parallel to said fluid flow direction; said flexible member overlying the two grooves and said separator wall so as to meter the flow between the inlet groove and outlet groove, and substantially the complete length of said separator wall and grooves in response to the dynamic pressure of the fluid flowing between the flexible member and the separator wall of the body member.

4,550,879

VERTICAL TYPE PULVERIZING AND CLASSIFYING APPARATUS

Akio Tanaka, Hirakata, and Yasuo Kamo, Sakura, both of Japan, assignors to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Feb. 10, 1984, Ser. No. 578,976
Claims priority, application Japan, Feb. 10, 1983, 58-21911
Int. Cl.[4] B02C 23/32
U.S. Cl. 241—52 **6 Claims**

1. A vertical type pulverizing and classifying apparatus comprising:

a pulverizing chamber provided with a pulverizing rotor disposed within a housing having upper, medial and lower portions,

a guide ring stationarily disposed above and coaxially with the pulverizing rotor, the guide ring defining inwardly thereof a descending gas stream passage for primary clas-

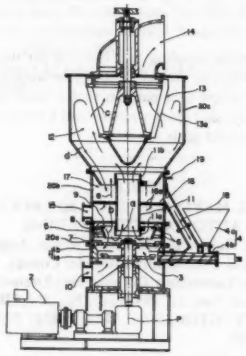
sification of material pulverized in the pulverizing chamber,

a classifying blade rotor disposed above and coaxially with the guide ring and driven so as to rotate within an upper housing portion, the blade rotor and the upper housing portion serving to define a classifying chamber therebetween for secondary classification of material fed from the guide ring,

a collecting passage disposed above the blade rotor into which fine particles from the classifying chamber flow is fed by gas streams,

a first material carrying gas feed duct disposed below the pulverizing rotor,

a plate member provided with pores disposed between the descending gas stream passage and the classifying chamber and arranged to serve as a partition therebetween,



a conduit having extremities axially disposed such that one extremity terminates within a zone defined by the guide ring and the opposite extremity extends through the plate member so as to terminate within the classifying chamber,

a second gas feed duct disposed below the plate member and arranged to supply a flow of gas to the pores of said plate member,

a coarse material floating chamber disposed within said medial housing portion above the plate member, said chamber being defined by said medial housing portion and the upper extremity of the conduit, and

return passage means disposed exteriorly of said housing and extending from coarse material floating chamber to said lower housing portion and into said pulverizing chamber, whereby coarser particles are separated from finer particles and recylced for further pulverizing.

4,550,880

METHOD AND APPARATUS FOR DETECTING THE POSITION OF A TAKE-UP PACKAGE DURING AN AUTOMATIC DOFFING AND DONNING CYCLE

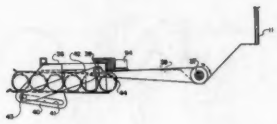
Kurt W. Niederer, Charlotte, N.C., assignor to Belmont Textile Machinery Company, Belmont, N.C.

Filed Apr. 6, 1984, Ser. No. 597,318
Int. Cl.[4] B65H *54/42, 63/00, 67/04*
U.S. Cl. 242—18 DD **16 Claims**

1. In a strand processing machine having a strand supply source, a yoke for holding a take-up package and means for rotating the take-up package to wind the strand thereon, the improvement which comprises an apparatus for detecting the position of the take-up package during an automatic doffing and donning cycle between winding cycles, said apparatus comprising:

(a) a chuck carried by the yoke and having two opposing chuck arms for clamping the take-up package for rotation therebetween, said chuck arms mounted for relative movement among three positions, a first position wherein the chuck arms are further apart than the length of the take-up package in order for the take-up package to be placed therebetween for donning, a second position with the take-up package properly donned on the chuck arm for winding, and a third position wherein the chuck arms are closer together than the length of the take-up package;

(b) means for moving said chuck arms among said first,



second and third positions during the doffing and donning cycle;

(c) detecting means for detecting that the chuck arms are in said third position; and,

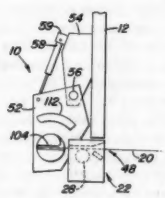
(d) alarm means cooperating with said detecting means for indicating that said chuck arms have assumed the third position and that a take-up package is not properly donned onto the chuck arms.

4,550,881

SCRAP SCROLLER FOR A SHEAR DISCHARGE CONVEYING SYSTEM

Peter W. Boardman, St. Catharines, Canada, assignor to Deere & Company, Moline, Ill.

Filed Nov. 28, 1983, Ser. No. 555,767
Int. Cl.[4] B65H *19/20*
U.S. Cl. 242—56 R **32 Claims**



1. In a conveying system for a shear having an elongated shear blade and a conveyor for moving cut metal in a preselected direction from the shear, a scrap scroller for moving strips of scrap metal cut from the shear away from the conveyor and compacting the strips, the scroller comprising:

a scroller frame located adjacent the shear;

a spindle rotatably mounted in the frame adjacent and offset to one side of the shear blade for rotation about an axis generally transverse to the shear blade and parallel to the preselected conveying direction, said spindle including a strip-receiving portion;

means for moving the strip parallel and adjacent to the shear blade;

guide means for directing one end of the metal strip into the receiving portion;

means for rotating the spindle to wind the strip in a compact scroll onto the spindle; and

means providing relative axial movement between the scroll of metal and the spindle for removing the scroll from the spindle.

4,550,882

REEL CUTTING AND WINDING MACHINE

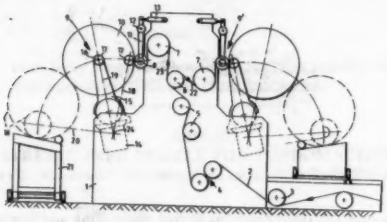
Armin S. P. Hutzenlaub, and Dieter Düppengiesser, both of Wiehl, Fed. Rep. of Germany, assignors to Erwin Kampf GmbH & Co. Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 586,964

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308059

Int. Cl.[4] B65H *35/04*

U.S. Cl. 242—56.6 **12 Claims**



1. A reel cutting and winding machine for longitudinally cutting a sheet into strips and for winding up the strips into separate wound packages, comprising:

(a) stationary mounting plates at either side of said machine,

(b) a cross-member pivotally mounted between said plates, said cross-member being pivotable into a winding position, a wound package sealing position, and a package depositing position,

(c) winding core means on which said strips can be wound,

(d) pivotably mounted swing arms carrying a pressure roller for engaging the periphery of the wound strip,

(e) lever means operatively connected to said cross-member and carrying said winding core means,

(f) carrier lever means pivotably mounted between said plates for movement between a waiting position during the winding process and a second, operating position,

(g) adjusting lever means pivotably mounted on said carrier lever means, and means to pivot said adjusting level means independently of said carrier lever means between a first strip cutting position and a second strip joining position,

(h) a vacuum table carried by said adjusting lever means, said carrier lever means and said adjusting lever means cooperating to pivot said vacuum table into a strip cutting position, said vacuum table holding by suction the strips while being cut and prior to mounting the leading end of said cut strip onto another winding core means, and

(i) cutting means for cutting said strip when retained by said vacuum table.

4,550,883

APPARATUS FOR STORING OR DISPENSING PAPER SHEETS OR THE LIKE

Heinz Boss, Strengelbach, Switzerland, assignor to Grapha Holding AG, Hergiswil, Switzerland

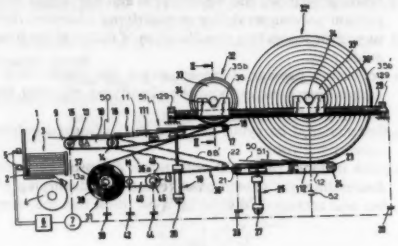
Filed Jun. 6, 1983, Ser. No. 501,271

Claims priority, application Switzerland, Jun. 9, 1982, 3548/82

Int. Cl.[4] B65H *29/66, 5/24, 5/28*

U.S. Cl. 242—59 **13 Claims**

1. Apparatus for storing the sheets of a stream of successive sheets between the convolutions of bands which are paid out by reels and are wound onto rotary cores to form therewith rolls for temporary storage of sheets and for evacuating stored sheets from such rolls, comprising a transporting unit defining for the sheets an elongated path; carrier means for movably mounting the cores of rolls at a level above said path, said carrier means extending in the longitudinal direction of said path and being arranged to simultaneously support a core and a roll; and support means for for movement in said direction wherein said transporting unit includes means for maintaining a portion of said path in a position in which such portion is at least substantially tangential to a core for winding and to a roll for unwinding on said carrier means irrespective of the position of the core for winding and the roll for unwinding with reference to the carrier means rotatably mounting a plurality of reels at a level below said path so that a band which extends between a core on said carrier means and a reel on said support means intersects said path.



4,550,884

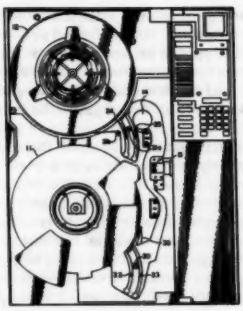
TAPE DRIVE HAVING SWING ARM BUFFERS AND AUTOMATIC THREADING

Ronald Permut; Robert Cope; James Apple; August P. Epina, and Frederick G. Munro, all of Boulder County, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 22, 1983, Ser. No. 554,428

Int. Cl.[4] G11B *15/66, 15/32;* **B65H** *59/38*

U.S. Cl. 242—189 **4 Claims**



1. A magnetic tape drive of the type in which magnetic tape is driven past a magnetic read/write head between a machine reel and a file reel by a capstan comprising:

a base casting;

hubs for said machine and file reels mounted on said base casting one above the other;

buffers mounted on said base casting between said reels and said capstan for decoupling the inertia of tape on said reels from said capstan, said read/write head, capstan, and buffers defining a substantially vertical tape path beside said file and machine reels and between them;

a pneumatic trough formed by said base casting, said trough extending from said file reel to said machine reel and following said tape path;

a vacuum motor applying a vacuum to the hub of said machine reel and drawing air through said trough during threading;

an opening in the bottom of said base casting below said trough and said tape path so that air flows through said

opening to engage tape from said file reel to thread it past said read/write head and said capstan to said machine reel;

said buffers including a swing arm biased away from said file reel and having a roller engaging said tape in said tape path to decouple the inertia of tape on said file reel from said capstan, said swing arm being pivoted at the rear of said base casting, said roller extending through a slot in said base casting to engage said tape;

means for retracting said swing arm to a position in which said roller is out of said tape path during threading; and

a sliding seal moved by said swing arm when it is retracted to move said seal to close said slot during threading.

4,550,885

SELF-BRAKING RIBBON TRANSPORT APPARATUS

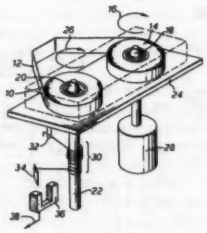
John F. Graham, Colinton, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 28, 1984, Ser. No. 645,131

Claims priority, application United Kingdom, Dec. 1, 1983, 8332064; Dec. 1, 1983, 8332062

Int. Cl.[4] G03B *1/04*; G11B *15/32*

U.S. Cl. 242—204 **29 Claims**



16. A ribbon transport apparatus for transporting a ribbon from a payout reel to a takeup reel, said apparatus comprising: a motor for rotating said takeup reel for drawing off the ribbon onto said takeup reel; a shaft for supporting said payout reel, said shaft being passively rotatable in a first direction by the movement of the ribbon from said payout reel onto said takeup reel; a friction brake on said shaft for opposing the rotation of said shaft with a predetermined amount of opposing torque; and an elastic energy store coupled to said friction brake for opposing the rotation of said friction brake with said shaft, where, the drawing of the ribbon onto said takeup reel is operative to cause said elastic energy store to store the energy imparted thereby to said shaft until said friction brake begins to slide on said shaft, where, thereafter said shaft is rotatable opposed by said predetermined opposing torque for maintaining tension in the ribbon between said payout reel and said takeup reel, and where, thereafter, upon cessation of said drawing of the ribbon onto said takeup reel, said elastic energy store is operable to deliver up a portion of said energy coupled to said friction brake to rotate said shaft in a second direction opposite to said first direction to take onto said payout reel any slack ribbon between said payout reel and said takeup reel and to maintain tension therein.

4,550,886

YARN END SUCKING AND HOLDING DEVICE IN WINDER

Michiaki Fujiwara, Kameoka, and Toshiharu Ikeda, Kusatsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed May 3, 1984, Ser. No. 606,764

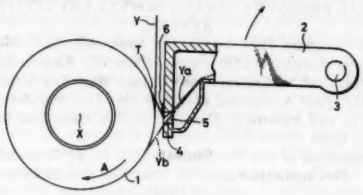
Claims priority, application Japan, May 4, 1983, 58-67104[U]

Int. Cl.[4] B65H *54/22*

U.S. Cl. 242—35.6 E **9 Claims**

1. A yarn end sucking and holding device for a package rotatably mounted on a winder, the package being rotatable about an axis passing through the center of the package, characterized in that said device includes:

a generally L-shaped body having two legs, one leg being tangential to the package and the other leg being perpendicular to said one leg and extending away from said package, the free end portion of said one leg having a suction slit formed thereon parallel with the direction of



the axis of the package and facing to a layer of yarn on the package; and

a yarn engagement member in the form of a blade having a tapered end, the blade member being fixedly attached to the outside of said one leg so that its tapered end part is projected downwardly into the slit, the edge of the tapered end being sufficiently blunt so that when a yarn end is pressed against the end, the yarn end remains uncut.

4,550,887

APPARATUS FOR THE SEPARATE WINDING OF SLIT WEBS

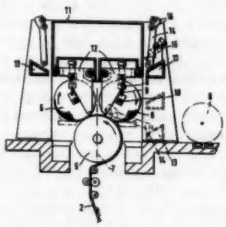
Herbert Schonmeier, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 343,127, Jan. 27, 1982, abandoned. This application May 3, 1984, Ser. No. 606,445

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102894

Int. Cl.[4] B65H *19/20, 17/00, 35/02*

U.S. Cl. 242—56.3 **1 Claim**



1. In an apparatus for the separate winding of longitudinally slit webs having a single support roll and at least two web rolls for winding the slit webs, which web rolls have shafts and ride on the support roll, the improvement comprising: means for positioning the web rolls on the upper half of the circumference of the support roll on alternate sides of a vertical plane passing through the axis of said support roll; a cross-bar extending parallel to the axis of the support roll; a plurality of web-roll carriages carried by said cross-bar for displacement along the cross-bar parallel to the axis of the support roll positioned in pairs corresponding to the width of the web strips to be wound and thereby to be aligned with the slits; load-reducing means disposed on the web-roll carriages and operatively connected with the web-roll shafts for reducing the web-roll load as a function of the instantaneous diameter of the web roll; vertically displaceable support bars disposed at the sides of and parallel to the cross-bars; a pair of press rolls for each of the web rolls; pivot levers pivotally connecting each

pair of press rolls to the support bars for vertical displacement with the support bars and to enable the press rolls to contact the circumference of a web roll; and means for urging the pivot levers to press the press rolls against the circumference of the web rolls.

4,550,888

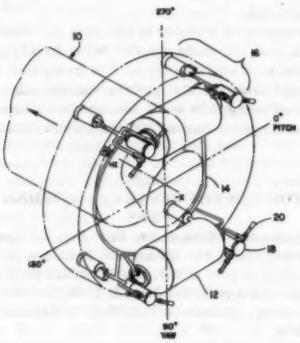
DUAL PRESSURE SOLID PROPELLANT CONTROL SYSTEM

Randle Douglass, 724 Glen Coe Ct., Sunnyvale, Calif. 94087; H. George Jacquin, 11220 Palos Verdes Ct., Cupertino, Calif. 95014; Paul M. Chewey, 1085 Golden Way, Los Altos, Calif. 94022; Paul A. Galvan, 1141 Corvallis Dr., San Jose, Calif. 95120, and Richard S. Naragon, 1127 S. Genevieve La., San Jose, Calif. 95128

Continuation of Ser. No. 840,941, Oct. 11, 1977, abandoned. This application Jun. 28, 1982, Ser. No. 392,830

Int. Cl.[4] F41G *7/00*

U.S. Cl. 244—3.22 **1 Claim**



1. A method for controlling the attitude and velocity of an aerospace platform having a post boost control system of the type including (1) a solid propellant gas generator for providing a hot gas output, the burn rate of said propellant being related directly to the pressure of said gas output so that the rate of said gas output is directly related to the gas pressure of said gas output, (2) valve clusters disposed symmetrically around the platform, each said valve cluster having a first high thrust nozzle oriented to produce thrust in a first direction relative to the platform and a second high thrust nozzle oriented to produce thrust in a direction 180 degrees from the first direction, each valve cluster having a first low thrust nozzle oriented to produce thrust in a direction 90 degrees from the direction of the thrust of said high thrust nozzles and a second low thrust nozzle oriented to produce thrust in a direction 180 degrees from the direction of thrust of said first low thrust nozzle, each said valve cluster having means for individually opening or closing the thrust nozzles associated therewith upon command, and (3) means for coupling the hot gas from said generator to an inlet part of each said valve cluster, said method for controlling the attitude and velocity of the aerospace platform providing a first pressure at the gas generator during velocity adjustments and a second, lower pressure during attitude adjustments to conserve propellant during attitude adjustments, during velocity adjustment said method comprising:

(a) closing all of said low thrust nozzles;

(b) closing all of said high thrust nozzles oriented opposite to the desired direction of thrust; and

(c) operating the high thrust nozzles oriented in the desired direction of thrust in a pulse duration mode, the ratio of time open to the time closed being selected to provide an effective nozzle throat area to provide a first selected pressure at said gas generator, whereby a first burn rate of said propellant is produced; and during said attitude adjustment, said method comprising:

(a) operating said high thrust nozzles in a pulse duration mode so that one half of the high thrust nozzles are open at any one time and no net acceleration is provided parallel to the velocity vector of said platform; and

(b) operating said low thrust nozzles in a pulse duration mode so that one half of the low thrust nozzles are open at any one time and to provide appropriate accelerations for the desired attitude adjustment, the effective area of the nozzle throat being greater than in said velocity adjustment, whereby the gas pressure in said gas generator is less than said first gas pressure to provide a propellant burn rate less than said first burn rate.

4,550,889

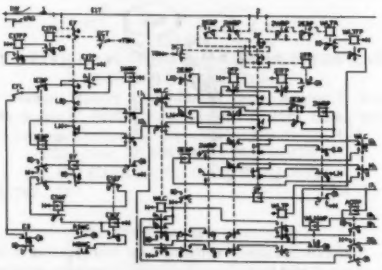
TRAFFIC CONTROL SYSTEM FOR SINGLE TRACK RAILROAD

David G. Emmel, Upper St. Clair Township, Allegheny County, Pa., assignor to American Standard Inc., Pittsburgh, Pa.

Filed Jul. 12, 1982, Ser. No. 397,383

Int. Cl.[4] B61L *21/00*

U.S. Cl. 246—28 R **8 Claims**



1. A traffic control system for a stretch of railroad track, over which trains may move in either direction, having a first and a second end location provided with train movement request apparatus and a plurality of intermediate junction locations dividing said track stretch into sections, comprising,

(a) a reversible traffic line circuit between each pair of adjacent locations,

(b) a source of line circuit energy at each location,

(c) a traffic control means at each location operable to a first and a second position for establishing a first or a second traffic direction, respectively, through said stretch,

(d) a traffic direction registry means at each location operable to a first and a second position,

(e) said traffic direction registry means at each junction location coupled to first and second line circuits extending to adjacent junction or end locations and operable to said first and second positions for registering the reception of line energy from the adjacent location in said first or second traffic direction, respectively,

(f) said traffic direction registry means at each end location controlled by the corresponding movement request apparatus and coupled to the associated line circuit to the adjacent junction location for at times transmitting line energy from the associated source when that location is a traffic exit end and responsive at other times to the reception of energy from the adjacent location for establishing that location as a traffic entrance end,

(g) each traffic control means controlled by the associated traffic direction registry means for operating to said first or second position as that registry means occupies its first or second position, respectively,

(h) said traffic control means and said traffic direction registry means at each junction location jointly controlling the associated line circuits for transmitting energy from the

associated source into the approach section line circuit for the desired traffic direction only when occupying corresponding positions,

(i) transmission of line energy in the same direction through each line circuit section between said end locations holding the established traffic direction to enable movement of a train in that direction,

(j) said registry means at each junction location comprises a first and a second register relay associated with a first and second line circuit terminating network, respectively, each relay energized for registering said first or second traffic direction, respectively, and both deenergized when line energy is absent from each line circuit during a traffic direction reversal,

(k) said traffic control means is a magnetic stick relay,

(l) a train detection track circuit means including an indication relay and a source of detection energy, reversibly coupled to the adjacent sections by first and second position contacts of said magnetic stick traffic relay,

(1) said indication relay energized to register an unoccupied condition of the track section to which coupled,

(m) each line circuit terminating network comprises,

(1) a first circuit path including energized position contacts of one register relay and corresponding position contacts of said magnetic stick relay for connecting said line energy source to the approach line circuit for the traffic direction established by the position of said magnetic stick relay,

(2) a second circuit path including energized position contacts of said track indication relay and deenergized position contacts of said one register relay for connecting the other register relay to the same line circuit to receive line energy from the adjacent location when the opposite traffic direction is being established, and

(3) a third circuit path including contacts of said magnetic stick relay corresponding to the direction registered by said other register relay for bypassing said track indication relay contacts in said second circuit path when said magnetic stick relay is repositioned to establish the opposite traffic direction, and

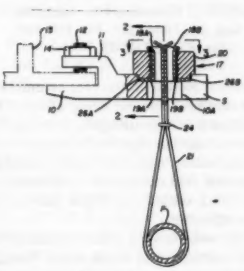
(n) the control circuit for said magnetic stick relay is controlled by contacts of said register relays for operating said magnetic stick relay to its first and second positions to establish first and second traffic directions as said first or second register relay is energized and the other deenergized, respectively.

4,550,890

PIPE HANGER

James Redman, 847 Cleveland Ave., Amherst, Ohio 44001, and Joseph E. Ellison, Vermillion, Ohio, assignors to James Redman, Amherst, Ohio

Filed Sep. 23, 1982, Ser. No. 422,157
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—59 **1 Claim**



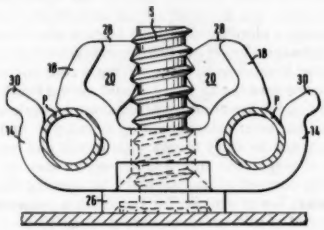
1. An improvement in a pipe hanger, said pipe hanger having a clamp with horizontally disposed vertically spaced members, one of which has a threaded opening for receiving a threaded bolt that extends toward the other member, the improvement comprising means in said clamp supporting the free ends of a strap adapted to encompass a pipe and holding said strap in non-rotating relation to said clamp, teeth on the edges of said strap, said free ends of said strap touching one another, said clamp having a vertically disposed aperture therein in spaced relation to said vertically spaced members, said means supporting said strap and holding said strap in non-rotating relation to said clamp including forming said vertically disposed aperture in upper and lower portions with a horizontally disposed shoulder therebetween, said upper portion having a larger diameter than said lower portion, the walls of said upper portion being tapered upwardly and outwardly, a nut, a pair of half sleeves positioned vertically through said nut, said half sleeves having oppositely disposed horizontally spaced vertical edges, outturned flanges on the lower ends of said half sleeves, said outturned flanges defining a greater diameter than said shoulder, said teeth on said free ends of said strap engaging the threads in said nut so that elevating and rotating said nut moves said strap and said pipe vertically and releasing said nut wedges said outturned flanges on said tapered walls of said upper portion of said verticaly disposed aperture in said clamp.

4,550,891

PLASTIC PIPE CLIP

Harald Schäty, Wetzlar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 6, 1983, Ser. No. 539,645
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238345; Oct. 15, 1982, 8229029[U]
Int. Cl.[4] F16L *3/22*
U.S. Cl. 248—68.1 **4 Claims**



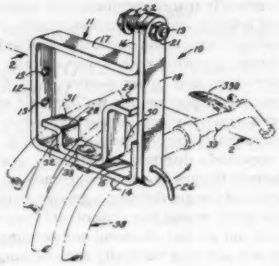
1. A plastic clip for securing one or more pipes to a threaded stud projecting from a surface, comprising, a body portion having a pair of pipe receiving portions extending upwardly therefrom each adapted for receiving a pipe and lying parallel to one another at either side of a stud receiving hole formed through a body portion of said clip, the axis of said hole lying in a direction transverse to that of a pipe when received in said pipe-receiving portion, said pipe receiving portions each providing an arcuate wall positioned to embrace a pipe when received in said pipe-receiving portion, part of said wall being movable between an open position to admit a pipe and a closed position to retain a pipe, said movable part of said wall of each pipe-receiving portion being comprised of an element integral with and rockable relative to said body portion of said clip, a rear side of each said element opposite to said wall overlapping said stud receiving hole and having teeth provided thereon for engagement with a thread configuration on the stud, and said body portion further having resilient feet extending downwardly therefrom to engage the surface from which the stud extends to accommodate registration of said teeth with a flank portion of said stud thread whereby a threaded stud when projecting through said hole behind said element holds said arcuate wall in its closed position with said teeth in engagement with the stud thread.

4,550,892

HOSE HOLDING DEVICE

Ray D. Whitley, 6021 Boulder Hwy., Las Vegas, Nev. 89122

Filed Apr. 18, 1984, Ser. No. 601,688
Int. Cl.[4] B05B *15/06*
U.S. Cl. 248—90 **1 Claim**



1. A hose holding device, comprising, in combination, a first bracket, a second bracket and a bar lever; said first bracket comprising a generally "C"-shaped, flat bar having a vertical leg between parallel horizontal arms, opposite ends of said bar being upwardly bent and forming parallel, aligned, vertical lips, said second bracket comprising a generally "J"-shaped, flat bar, opposite ends of said "J"-shaped bar being bent in outwardly opposite directions and forming horizontal lips, said second bracket being located inside said first bracket, a single bolt fastener securing a lower portion of said second bracket to a lower portion of said first bracket, both said brackets being in the same flat plain, a space between an upper side of said second bracket and an upper of said arms of said first bracket for receiving a plurality of turns of a hose coiled therethrough, a space between a lower of said second bracket lips and a lower of said first bracket arms for receiving a coupling end of said hose, a space between an upper of said second bracket lips and said first bracket lower arms for receiving a nozzle end of said hose, said bar lever bridging across an entry to said hose coil turn space and an entry to said hose nozzle end space, a bolt fastener through said first bracket upper arm lip pivotally supporting one end of said bar lever, an opening through said first bracket lower arm lip for receiving a projection on an opposite end of said bar lever, spring means to disengage said projection from said lip, and mounting means on said first bracket for attachment to a rear of a concrete mixer truck.

4,550,893

HANGER CLIP FOR RETAINING A COMPONENT TO A SLOTTED UPRIGHT

Delbert Wiersema, Zeeland, and John A. Szmadzinski, Grand Rapids, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

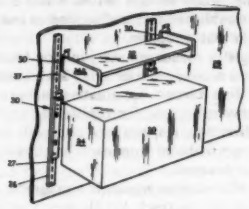
Filed Apr. 30, 1982, Ser. No. 373,425
Int. Cl.[4] A47G *55/00*
U.S. Cl. 248—222.4 **16 Claims**

1. In a hanger clip for releasably securing a component to an upright including a plurality of vertically spaced slots in a wall having exterior and interior sides, said hanger clip having front and rear webs; hook means including depending flanges projecting outwardly from said rear web for receipt in said vertically spaced slots with said depending flanges adapted to abut the interior sides of said upright wall so as to mount said clip to said upright; and means adapted to connect said front web of said clip to said component;

the improvement which comprises:

biasing means acting between said clip and said upright for urging said hook means against said interior side of said upright;

said hook means including a projection on a bottom portion of said depending flange and extending at substantially right angles thereto in the direction of the interior wall of said upright, said hook means adapted to seat within a slot



for preventing upward movement of said clip with respect to said upright;

whereby said biasing means prevents accidental dislodgement of said clip from said upright.

4,550,894

TRIVET

John J. Barlics, 7 Denver Blvd., North Edison, N.J. 08820

Filed Nov. 5, 1982, Ser. No. 439,589
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—346 **3 Claims**

1. A trivet, comprising a plurality of coaxially arranged bodies made from heat-resistant material, each body being ring-shaped and including an opening extending therethrough and a continuous sidewall completely surrounding said opening, said sidewall having an upper sealing surface of a first width for forming a substantially air-tight seal with a hot object supported by said sidewall, a lower sealing surface of a second width, which is greater than said first width, for forming a substantially air-tight seal with a support structure on which said sidewall rests, and a trapezoidal cross-sectional shape and said sidewall being substantially non-collapsible, whereby said upper and lower sealing surfaces cooperate with said sidewalls and said openings to create dead air spaces between the hot object and the support structure.

4,550,895

RAM CONSTRUCTION FOR OIL WELL BLOW OUT PREVENTER APPARATUS

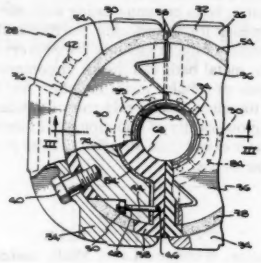
Donald U. Shaffer, 2850 E. Coronado St., Anaheim, Calif. 92806

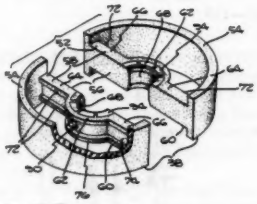
Filed Sep. 24, 1984, Ser. No. 654,162
Int. Cl.[4] E21B *33/06*
U.S. Cl. 251—1.3 **16 Claims**

1. A ram seal element for use in the ram assembly of a blow out preventer, said ram seal element being adapted to provide sealing of variable diameter drill strings to prevent blow out of well pressure when said drill strings are in use within said well, said ram assembly including a ram block for biasing said ram seal element against said drill string and a ram block holder for mounting said ram block within said blow out preventer, said ram seal element comprising:

a semi-circular elastomer having a diametrical portion and a circumferential portion, said diametrical portion having an inner side sealing surface, top and bottom surfaces and an outer side surface, said diametrical portion further including an elastomer central collar section and two elastomer side sections, said collar section having an inner

surface defining an arcuate recess in the sealing surface of said diametrical portion for sealing contact with a drill string, wherein the outer side surface of said diametrical portion is adapted for contact with said ram block, said ram block being movable toward said drill string to bias said diametrical portion against said drill string, said outer surface including a longitudinal channel therein extending substantially the entire length of both said central collar section and side sections of said diametrical portion and being sealed off from said well pressure, said channel





defining an expansion zone between said diametrical portion and said ram block when said ram seal element is in sealing portion in said ram assembly, wherein said expansion zone has a sufficient volume to allow uniform expansion of said diametrical portion into said expansion zone when said seal is used to seal drill strings of increasing diameter, said seal element thereby being useful to provide sealing of variable diameter drill strings to prevent blow out of well pressure when said drill strings are in use within said well.

4,550,896

VALVE-STRAINER HOUSINGS AND ASSEMBLIES

Charles C. Hansen, III, 1410 Brooke Dr., Downers Grove, Ill. 60515

Filed Apr. 4, 1984, Ser. No. 596,653

Int. Cl.[4] F16K *25/00*; B01D *21/24*

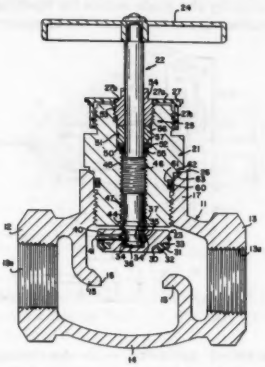
U.S. Cl. 251—84 **10 Claims**

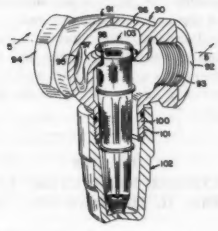
1. In a housing adaptable for use in a globe valve or a check valve, said housing including an inlet passageway, an outlet passageway, and a central chamber portion positioned therebetween, said central chamber portion including a curved chamber dividing wall which bifurcates said housing into inlet and outlet portions, respectively, said curved dividing wall including a mediate portion having a generally circular aperture therethrough defining a zone for fluid flow between said inlet and said outlet portions, an annular flange extending from an outer wall of said central chamber portion in a direction coaxial and in spatial relation with said circular aperture through said dividing wall, and closure means engageable with said annular flange for sealing said flange against liquid flow outwardly therefrom,

an improvement wherein said closure means include a cover which is sealingly engageable with said annular flange,

said housing is adaptable for receiving a filter member therein for functioning as a strainer housing; and

said filter element includes a generally cylindrical body having a foraminous side wall, an annular top portion which is adapted for being retained on said dividing wall generally circular aperture, and means adjacent at least one of the bottoms of said closing means for biasing said element upwardly with said top portion biased against said circular aperture.





8. In a generally cylindrical valve disc adapted for use in a valve assembly, said valve disc including an annular recess extending radially inwardly adjacent a bottom of said disc for receiving and retaining an annular sealing seat member thereon,

an improvement wherein said recess is generally rectangular in radial cross-section and includes a radially extending lip at a bottom end thereof for retaining said annular sealing seat once same is stretched thereover, and at least one of the remaining surfaces of said annular recess includes an annular discontinuity of a size sufficient to create a sealing engagement by deforming an adjacent surface of said annular sealing seat contiguous therewith.

4,550,897

TRACK CLEARING DEVICE FOR PUSHING APART RAIL VEHICLES

Bruno Raffenberg, Ahornweg 10, Dortmund 1, Fed. Rep. of Germany 4600

Filed Feb. 21, 1984, Ser. No. 581,971

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 8309463[U]

Int. Cl.[4] B66F *3/00*

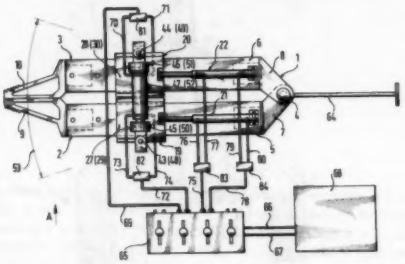
U.S. Cl. 254—93 R **5 Claims**

1. An apparatus for pushing apart railway vehicles, comprising:

an expander means having two expander arms, each expander arm comprising a re-railing bridge, a pivot arm coupled to one end of the re-railing bridge, and a grab claw mounted to the other end of the re-railing bridge, wherein the expander arms are pivotally coupled to one another by a pivot pin;

two guide means having upper and lower guide members, each guide means is slidably mounted on a different expander arm;

two lifting means are transversely mounted across the expander arms by the guide means for opening and closing the pivotable expander arms of the expander means;



two displacement cylinders, each displacement cylinder having one end that is mounted to one of the guide means and another end that is mounted to one of the expander arm, wherein the displacement cylinders are used to longitudinally position the guide means and therefore the lifting means along the expander means; and

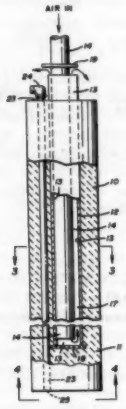
a source of fluid under pressure having a pump that is fluidically coupled to the lifting means and the displacement cylinders through a control panel and hoses for controlling the operating of the lifting means and the displacement cylinders.

4,550,898

AIR COOLED REFRACTORY LANCE

Michael D. LaBate, II, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jun. 4, 1984, Ser. No. 617,253
Int. Cl.[4] C21C 5/32
U.S. Cl. 266—220 **10 Claims**



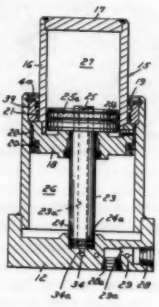
1. A fluid cooled lance for use in treating a bath of molten metal comprising an elongated tubular refractory body, a pair of tubular metal members arranged coaxially in said elongated refractory body, one of said tubular metal members having a plurality of transversely flat wall sections engaging the inner surface of said elongated tubular refractory body, the other of said tubular metal members disposed within said first mentioned tubular metal member shaped to form a plurality of separate longitudinally extending passageways, said tubular metal members extending outwardly of one end of said elongated tubular refractory body and forming means for introducing a coolant fluid into said lance and directing said coolant fluid therefrom, a secondary tubular member in said elongated tubular refractory body communicating with the opposite ends thereof and means for introducing, stirring and refining gas into said secondary tubular member for delivery by said lance to said molten metal bath and means in communication with one of said pair of tubular metal members for introducing a coolant fluid thereinto, one of said pair of tubular metal members extending outwardly of said elongated tubular refractory body to a greater extent than the other so as to form a handling and supporting means.

4,550,899

PNEUMATIC SPRING

David M. Holley, Whitmore Lake, Mich., assignor to Power Components Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 180,133, Aug. 21, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,727
Int. Cl.[4] F16F 9/02, 9/34
U.S. Cl. 267—119 **3 Claims**



1. A pneumatic spring for absorbing an external force by compressing a gaseous fluid trapped therein comprising

an outer housing comprising a base wall and a side wall defining a first cylinder having an open end,

a second cylinder slidingly and sealingly positioned in the first cylinder,

seal means between said cylinders,

said second cylinder having a cylindrical side wall and inner and outer end walls,

a rod extending from the base wall of the first cylinder through the inner end wall of the second cylinder,

a piston fixed on the rod within the second cylinder,

thereby defining a first chamber between the base wall of the first cylinder and the inner end wall of the second cylinder and a second chamber between the piston on the rod and the outer end wall of the second cylinder,

said chambers being isolated from one another and being normally charged with gaseous fluid such that fluid will not flow between said chambers during operation,

said base wall having a single inlet and passages selectively connected to said inlet for supplying fluid under pressure to each of said chambers,

a valve in each passage entirely within said base wall providing gaseous fluid under pressure to each passage such that the chambers remain isolated from one another whereby

when a force is applied to move the second cylinder axially inwardly of the first cylinder, the pressures in the two chambers are built up independently of one another,

each said valve including check valve means and pressure relief valve means for relieving the pressure in its respective chamber.

4,550,900

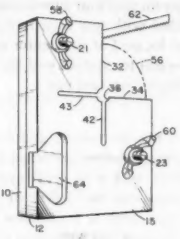
HOLDING DEVICE FOR SEGMENTING A WORKPIECE

William H. Retsch, Castle Shannon, and Stanley F. Zdziarski, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 426,532, Sep. 29, 1982, abandoned. This application Jan. 31, 1984, Ser. No. 575,428

Int. Cl.⁴ B25B *1/00*

U.S. Cl. 269—87 **8 Claims**



1. A device for holding a workpiece to permit radial cutting of the workpiece into two or more segments, comprising:

a. a first block with an inner and outer face and peripheral sides and wedge-shaped opening extending from the inner face to the outer face and formed by intersecting sides extending into the block from two contiguous peripheral sides of the block,

b. a depression in the inner face of the first block beginning on each intersecting side that forms the wedge-shaped opening of the first block at a point on said intersecting sides equidistant from the contiguous peripheral sides of the block and extending laterally into the center of the first block where said depression has peripheral side walls, and where said depression begins on the inner face and extends into the block a distance to form a surface substantially parallel to the inner face, and where the intersecting sides forming the wedge-shaped opening extend to the center of the depression,

c. a second block with an inner and outer face and peripheral sides and wedge-shaped opening similar to that of the first block extending from the inner face to the outer face formed by intersecting sides extending into the block from two contiguous peripheral sides of the second block,

d. a depression in the inner face of the second block similar to that of the first block beginning on each intersecting side that forms the wedge-shaped opening of the second block at a point on said intersecting sides equidistant from the contiguous peripheral sides of the second block and extending laterally into the center of the second block where said depression has one or more peripheral side walls, and where said depression begins on the interface and extends into the block a distance to form a surface parallel to the inner face and where the intersecting sides forming the wedge-shaped opening extend to the center of the depression,

e. an attachment means to attach the first block to the second block so that the wedge-shaped openings match and the depressions of each block match to form a cavity, whereby an uncontained portion of a workpiece can protrude into the matched, wedge-shaped openings of the first and second blocks from the cavity to allow for two straight radial cuts to be made through the workpiece by guiding a cutting device along the intersecting sides of the attached holding blocks that form the opening.

4,550,901

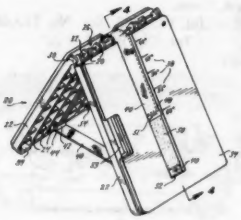
PORTABLE ADJUSTABLE BODY TILT BOARD

Thomas P. Muchisky, 784 Hawthicket La., Des Peres, Mo. 63131, and James V. Young, 35 Benton Pl., St. Louis, Mo. 63104

Filed Apr. 4, 1983, Ser. No. 481,840

Int. Cl.⁴ A47C *21/00*

U.S. Cl. 269—328 **12 Claims**



1. A portable, adjustable tilt board to at least partially support and position a human body for therapy, comprising:

a pair of panels;

hinge means joining said panels along an edge thereof;

means to selectively fix the angular separation between said panels so that said tilt board may be propped open on a supporting surface with the panels oriented at the selected angle as an aid in supporting and positioning a human body for therapy, said panel fixing means including at least one strap extending between said panels, said strap wrapping at least partially around both of said panels;

means for securing one end of said strap to one of said panels;

means for securing the other end of said strap, said other end strap securing means including means to secure said other end to a medial portion of said strap; and

a scale associated with said panel fixing means to indicate the angle formed by each panel with the supporting surface.

4,550,902

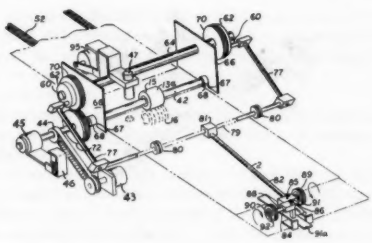
STOCK FEEDING MACHINE

Edward S. Godlewski, 129 Spruce St., Wooddale, Ill. 60191

Filed Jul. 27, 1983, Ser. No. 517,621

Int. Cl.⁴ B65H *3/32*

U.S. Cl. 271—10 **13 Claims**



1. A feeding mechanism having a stack support means for supporting a stack of paper sheets having leading and trailing ends,

register means at one end of said stack support means for engagement with the trailing ends of said sheets,

and means for peeling the sheets of paper in the stack one by

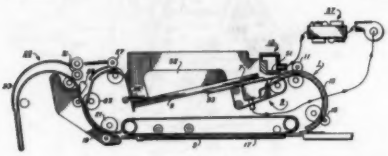
one from the top by sliding the top sheet into abutment with its trailing end against said register means and then sliding the same top sheet in the direction of its leading end into associated mechanism, and said peeling means comprising a pair of elastomeric wheels one rotatable in one direction toward the leading end of the sheet and the other in the reverse direction on the top sheet and operative as swabs.

4,550,903

SHEET FEEDING APPARATUS AND VALVE THEREFOR

Kenneth P. Moore, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 13, 1983, Ser. No. 513,484
Int. Cl.[4] B65H *3/14*
U.S. Cl. 271—98 4 Claims



1. A bottom sheet separator/feeder for separating and forwarding sheets seriatim having a stack tray adapted for supporting a stack of sheets and means for determining the stack size being fed, comprising:

air injection means adapted to provide a layer of air between the tray and the bottom sheet in the stack in between the bottom sheet and the remainder of the sheets in the stack,

blower means associated with said air injection means to provide positive air pressure for said air injection means,

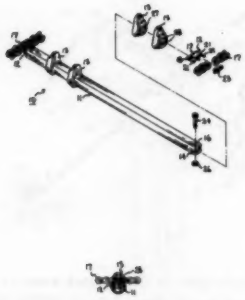
valve means associated with said air injection means being adapted to control the flow of air thereto from said blower means and having a plurality of adjusting devices each being arranged to provide a different air flow to said injection means in accordance with different stack sizes.

4,550,904

PAPER SUPPORT BAR WITH ROTATION RESISTANT SUPPORT FINGERS

Elias J. Union, Blair, Nebr., assignor to J. C. & D Enterprises, Inc., Omaha, Nebr.

Filed Apr. 27, 1984, Ser. No. 604,360
Int. Cl.[4] B65G *29/00*; B41F *21/08*
U.S. Cl. 271—198 1 Claim



1. In a paper support bar for use in a chain driven printing press having at least two substantially parallel disposed drive chains, the paper support bar including an elongated generally rectangular bar having a first end and a second end and a plurality of paper support fingers movably disposed on said bar, an improvement comprising:

a first connecting link affixed to said first end of said bar for attaching said first end to one of said drive chains;

a second connecting link affixed to said second end of said bar for attaching said second end to another of said drive chains; and

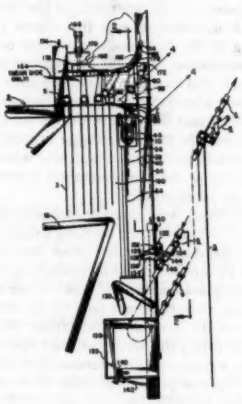
an inclined edge formed on the reduced distal end of each of the said plurality of paper support fingers such that only a narrow edge serves as a paper contacting surface, wherein each of said fingers is further provided with a generally square shaped hole formed therethrough as defined by four substantially planar surfaces, which closely conforms to the cross-sectional dimensions of the elongated bar to allow axial translation of the said fingers along the said bar, while preventing relative rotation of the said fingers on said bar, wherein said four substantially planar surfaces are each provided with one raised ridge parallel to said support bar and located at the center of each planar surface formed thereon to contact said bar and aid in snugly retaining said fingers on said bar.

4,550,905

HIDE TRANSFER APPARATUS

Wolfgang K. Heiland, Trevose, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 27, 1984, Ser. No. 625,272
Int. Cl.[4] B65H *31/00*
U.S. Cl. 271—202 6 Claims

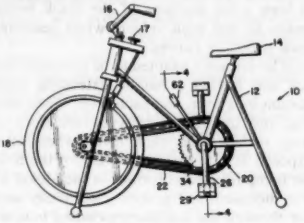


1. An apparatus for transferring hides from one conveyor on which each hide is draped over a carrier bar at about the center of its lengthwise dimension to a second, faster moving conveyor on which the hides are held at one end only, comprising, in combination, means for spreading apart the halves of a hide draped over a carrier bar, means for guiding and positioning a spread-apart hide-half for transfer of the hide to the second conveyor, means for gripping the leading edge of the foregoing guided and positioned hide-half to pull the hide off the carrier bar, and means for clamping the leading edge of the hide to transfer the hide to the second conveyor.

4,550,906
BICYCLE TYPE EXERCISE APPARATUS WITH INDEXING PEDAL CRANKS

Darryl Im, 3041 Via Mondo, Compton, Calif. 90221

Filed Feb. 16, 1983, Ser. No. 466,882
Int. Cl.[4] A63B *21/22, 23/04*
U.S. Cl. 272—73 4 Claims



1. Exercise apparatus which comprises:

a frame,

apparatus for pedalling carried on said frame,

said apparatus for pedalling including a first pedal carried on a first crank arm fixed to a first shaft, means rotatably mounting said first shaft on said frame, a second pedal mounted on a second crank arm fixed to a second shaft, means rotatably mounting said second shaft on the frame, said first and second shafts having a common axis, means for selective angular indexing of said first crank arm relative to said second crank arm between at least a first position wherein said first and second crank arms are disposed in the same angular orientation and a second position wherein said first and second crank arms respectively extend in substantially opposite directions from said common axis,

said means for indexing comprises a clutch mechanism having mutually engageable confronting jaw elements, each jaw element being associated with one of said shafts, and

each of the confronting jaw elements having at least one face oblique to said common axis.

4,550,907
EXERCISING APPLIANCE

Anthony Melillo, 90 Boulderwood Dr., Bernardsville, N.J. 07924, and Louis Gabriele, 39 Windgate Dr., Livingston, N.J. 07039

Filed Aug. 15, 1983, Ser. No. 523,326
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—93 31 Claims

1. An exercising appliance comprising a first portion and a second portion, said first and second portions being pivotally connected to one another at a pivot axis located at respective ends of said portions, said first portion including:

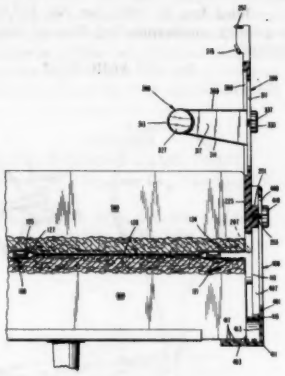
(a) first means including corrigation adapted to frictionally retain said first portion in a substantially fixed position when said first portion is placed in a confined space; and

(b) second means adjacent said pivotally connected end for limiting the movement of said first portion into said confined space to a pre-determined distance;

said second portion including guide means substantially centrally located thereon and

(c) bar means mounted on said second portion including:

(i) third means interengaging with said guide means to allow slidable movement of said bar means with respect to said guide means; and

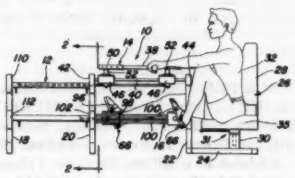


(ii) fourth means adapted to interengage with said spaced third means to lock said bar means into pre-determined positions.

4,550,908
PHYSICAL-REHABILITATION AND EXERCISING APPARATUS

Voris F. Dixon, 1937 E. Blair Ave., Santa Ana, Calif. 92705

Filed Jan. 16, 1984, Ser. No. 570,889
Int. Cl.[4] A61H *1/02*
U.S. Cl. 272—130 8 Claims



1. A physical-rehabilitation and exercising apparatus for the handicapped and disabled individual, wherein the active limb members of the user assist in rehabilitating and exercising the inactive limb members, said apparatus comprising:

a frame structure;

a chair-support means mounted to said frame structure and adapted to support the user thereof while operating said apparatus;

arm-control means slidably mounted to said frame structure for reciprocal horizontal movement along said frame;

leg-control means slidably mounted to said frame structure for reciprocal horizontal movement along said frame, said leg-control means being positioned below said arm-control means; and

wherein said arm-control means and said leg-control means are adapted to be reciprocally actuated in an individual selective manner in accordance with the user's requirements;

means for selectively controlling the reciprocating action of said arm and leg control means.

4,550,909

TENNIS RACKET FRAME

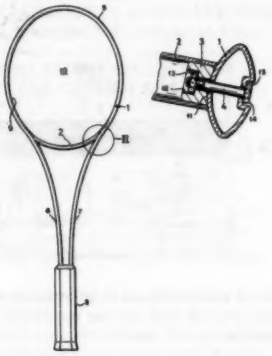
Reinhold Sommer, Helgolandring 68, 4300 Essen 1, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,978

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024234

Int. Cl.⁴ A63B *49/02*

U.S. Cl. 273—73 G **7 Claims**



1. A tennis racket frame comprising a tubular frame-forming member having an oval-forming portion adapted to be spanned by racket stringing, and a pair of shanks reaching away from said oval-forming portion toward a handle, respective connecting members mounted upon inner flanks of each of said shanks at the bottom of said oval-forming portion, a curved tubular bridge piece extending along and completing the bottom of the oval formed by said portion and interfitting with said connecting members, said connecting members being projections plugged into said bridge piece and have outer configurations complementary to the inner configuration of said bridge piece, and bolt means releasably interconnecting each of said connecting members upon the respective flanks of said shanks.

4,550,910

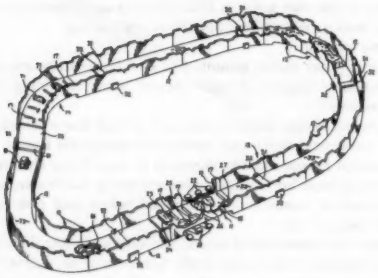
TOY TRACK PRESENTING INTERFERENCE TO PASSAGE OF TOY VEHICLES THEREON

Adolph E. Goldfarb, 1432 S. East Wind Cir., Westlake Village, Calif. 91361, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.

Filed Feb. 10, 1984, Ser. No. 578,860

Int. Cl.⁴ A63F *9/14;* **A63H** *18/08*

U.S. Cl. 273—86 B **12 Claims**



7. A toy track for use on a supporting surface, and for use with a self-propelled toy vehicle that has a plurality of front wheel means and that is adapted to operate on the track and that depends exclusively upon interaction between the track and the vehicle wheels for guidance and depends exclusively upon the user of the toy track and vehicle for starting-and-stopping control; and comprising:

an elongated track having a floor and having a wall at each side of the floor, said floor defining a plurality of holes and being at least in part spaced above such supporting surface; at least some portions of the track being curved horizontally so that such vehicle when operating on the track must negotiate curves;

a plurality of levers, each adapted to be pivotally mounted to the track and having a handle extending laterally for manipulation by a user, and each lever when so mounted extending into the region between the floor and such supporting surface, and each lever when so mounted being exposed at a corresponding one of the holes;

an irregular bump fixed to or formed in each lever when that lever is so mounted, and generally vertically movable by that lever through the said corresponding hole when that lever is so mounted to vary the height of the bump above the floor at that hole in such a way as to erratically interfere with the wheels and chassis of such vehicle and to erractically perturb the progress of such a vehicle along the track to an extent which varies in dependence upon such manipulation of the corresponding lever handle by such a user; and

means for redirecting such vehicle at certain curved portions of the track by selectively impeding the inside wheel means so that such vehicle tends to negotiate those certain curved portions of the track without striking the wall at the outside of those curved portions;

the redirecting means including transversely extended bumps on the floor of those certain curved portions of the track, and the bumps being discrete components, positionable by the user of the toy track at any of the positions where holes are defined in the floor of the track, except those positions where the levers when so mounted are exposed, the holes being adapted to receive and secure the bump components; and

whereby the user of the toy track may arbitrarily choose such selectable positions for the bumps, from among any of the multiplicity of positions where there are holes defined in the floor of the track.

4,550,911

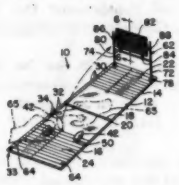
SCOOT BALL GAME APPARATUS

James A. Daley, 121½ N. Wabash, Glendora, Calif. 91740

Filed Aug. 29, 1983, Ser. No. 527,239

Int. Cl.⁴ A63F *7/06, 7/30*

U.S. Cl. 273—94 **19 Claims**



10. A game apparatus including:

a playing board having a longitudinal direction and first and second side edges, and having:

a surface with predetermined frictional characteristics,

a plurality of bands extending transversely of the playing board and including:

first gain indicating bands,

first loss indicating bands, said first gain indicating bands and said first loss indicating bands being nested adjacent said first end,

second gain indicating bands,

second loss indicating bands, said second gain indicating bands and said second loss indicating bands being nested adjacent said second end,

a slider member having:

a first end defining a pointer,

a second end opposite said first end,

a slider surface adapted to slide on said surface of said playing board with predetermined frictional characteristics,

said pointer defined on the slider member being smaller in size than the widths of the respective bands to provide positive indication of which band the pointer overlies to register a gain or loss,

a scale extending from said first end to said second end along said first side edge, said scale including:

an odd number of spaces, said apparatus further including a marker member sized to be used in association with said odd number of spaces to indicate on said scale the accumulation of losses and gains of players using said apparatus, and

goal post structure having:

first and second uprights with inwardly extending stops thereon,

a crossbar connected to said first and second uprights, and

a panel hingedly mounted to said crossbar and adapted to two stable positions, the first in contact with said stops generally between said first and second uprights above said crossbar and a second below said crossbar, and

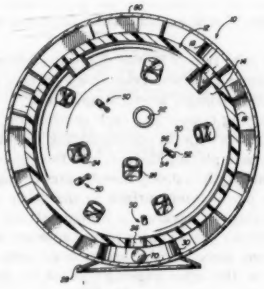
means to removably support said first and second uprights of said goal post structure on the playing board.

4,550,912

SPHERICAL MAZE GAME APPARATUS

David L. Allen, 447 W. Sunset Cir., Mesa, Ariz. 85201

Filed Nov. 14, 1983, Ser. No. 551,420
Int. Cl.⁴ A63B *67/14*
U.S. Cl. 273—113 **6 Claims**



1. Three dimensional maze apparatus, comprising, in combination:

first spherical means, including

a first spherical surface having an outer periphery and an inner periphery, and

maze barriers disposed on the first spherical surface defining a plurality of false paths and a single preferred path;

second spherical means disposed concentrically about and secured to the first spherical means and defining a transparent covering for the first spherical means and adapted to be held by a user to move the first spherical means in three dimensions to control the movement of the rolling element on the outer periphery of the first spherical means;

base means secured to both the first spherical means and the second spherical means and defining a stand for supporting the maze apparatus when it is not being used;

a rolling element disposed on the outer periphery and adapted to be moved on the outer periphery by a user moving the first spherical means in three dimensions to control the movement of the rolling element; and

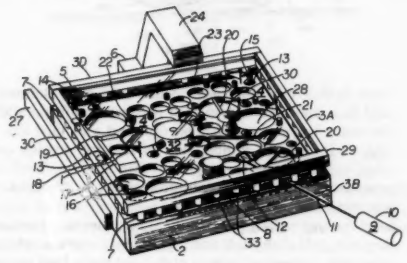
aperture means extending through the first spherical means for communicating between the outer periphery and the inner periphery, including a plurality of apertures spaced apart along the false paths through which the rolling element may fall into the interior of the first spherical means, including a base aperture through which the rolling element may fall into the base means from the first spherical means.

4,550,913

COIN CROSSING GAME DEVICE

William J. Price, 5731 Kingsgate Dr., Apartment C, Orlando, Fla. 32808

Filed Sep. 24, 1984, Ser. No. 653,843
Int. Cl.⁴ A63F *7/06*
U.S. Cl. 273—126 R **2 Claims**



1. A game device for use with a coin comprising;

a square-shaped horizontal lower portion, said lower portion being a square-shaped, planar transparent member and having side members extending upwards and along each side of said transparent member to form a tray-like configuration; each of said side members having spaced apart dowel elements extending upwardly therefrom, a support element being attached to said device at the intersections of said side members; a planar game board supported on said support elements, said game board having numerous holes cut therethrough and numerous obstacles attached to the top surface thereof; said game device further comprising an upper portion having a configuration substantially similar to said lower portion and having a transparent planar surface; said upper portion having four sides, each side having recesses in the underside thereof; said recesses being positioned to receive a respective one of said dowels whereby said top portion is supported over said game board and lower portion in substantially parallel spaced relationship; and at least one hand-held game tool having a cylindrical handle thereon, said tool having a shape similar to a knitting needle and being provided to maneuver a coin across said game board.

4,550,914

GOLF CLUB HEAD WITH VISUAL SWING-DIRECTING CUES

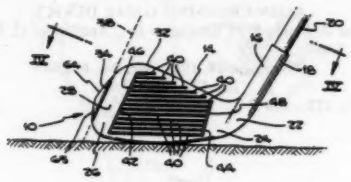
John McCallister, 3941 Fairbreeze Cir., Westlake Village, Calif. 91361

Filed Sep. 6, 1984, Ser. No. 648,762
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—183 D **12 Claims**

1. A golf club head adapted to provide a visual cue to a golfer which promotes an inside-outside forward swing of the club head by the golfer when the club head is positioned on a playing surface, said club head comprising:

a club head body having a heel portion, a toe portion, a front face, a bottom and a top edge, said toe portion having an outer edge which slants towards the golfer when said club

head body bottom is positioned on said playing surface, said front face including a plurality of spaced horizontal face lines which are visible to the golfer and substantially horizontal when said club head body is positioned on said playing surface and wherein each of said face lines includes a toe end and a heel end, said face lines being of selected lengths and positioned on said front face to provide a face line toe edge defined by said face line toe ends which is substantially parallel to the outer edge of said toe portion, said selected lengths and positioning of said face



lines further providing a face line heel edge defined by said face line heel ends which is substantially parallel to the outer edge of said toe portion and said face line toe edge, wherein the combination of said toe portion outer edge, said face line toe edge and said face line heel edge provides a visual cue to said golfer which promotes said inside-outside swing; and

a hosel having a shaft portion including means for connection to a golf club shaft and a club body portion which is integrally connected to said club head body heel portion.

4,550,915

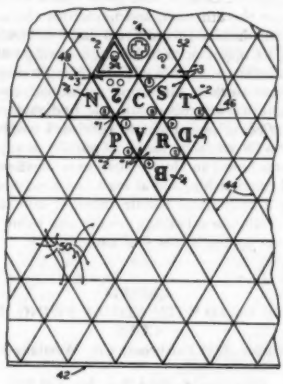
GAME WITH TRIANGULAR SHAPED PLAYING ELEMENTS

William D. Meyer, 2816 Sutton Blvd., St. Louis, Mo. 63143

Continuation of Ser. No. 557,258, Dec. 2, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,478

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—272 **8 Claims**



1. A game played by forming words from adjacent triangular shaped playing pieces played in sequential turns by game players wherein one or more words are formed by letters appearing on playing pieces placed adjacent to one another in side by side relationship on a playing surface whereby words can be formed by combinations of letters appearing on adjacent playing pieces comprising a playing surface and a plurality of playing pieces each having the same size and triangular shape to be placed by players in sequence on the playing surface, one triangular shaped surface of each playing piece being marked with a symbol, the symbols on selected ones of said playing pieces being letters of the alphabet and point values associated therewith, the symbols on selected other playing pieces including distinctive indicia used to control the game strategy, said distinctive indicia including first indicia on some of the playing pieces to increase a players point score for a word formed, second indicia to be used as a substitute letter for any letter of the alphabet as an aid to forming a word, and third distinctive indicia to award the player playing that piece an option in the order of plays by the game players as by allowing manipulation of a player's turn.

4,550,916

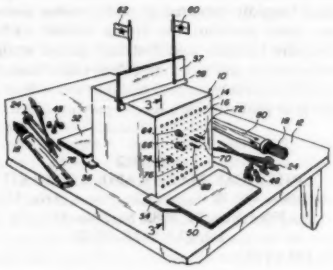
CUBE GAME OF SKILL AND CHANCE

Ralph O. Ortiz, 100 Beekman St., Apt. 8-D, New York, N.Y. 10038

Filed Jun. 21, 1984, Ser. No. 623,141

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—239 **8 Claims**



1. Cube game of skill and chance, comprising in combination:

(a) a hollow cube two of whose opposite surfaces comprise identical playing surfaces comprising grids of a multiplicity of correspondingly identical apertures;

(b) flexible tubing connecting each aperture on one of said playing surfaces with the corresponding identical aperture on the opposite playing surface, said flexible tubing being of sufficient length to droop thereby preventing passage of light from one playing surface to the other while sufficiently flexing to receive a horizontal rod extending therein, thereby preventing a player adjacent one playing surface from detecting the insertion of rods in specific apertures on the other playing surface by an opposing player;

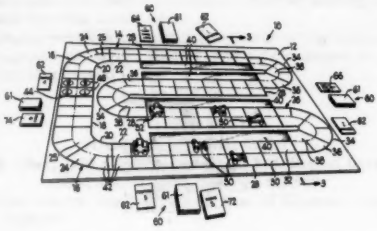
(c) rod shaped members for insertion through said apertures into said tubing, said rod shaped members formed into two groups including a first group of simple rods having a length greater than the distance between said opposite surfaces, whereby when inserted both players may view the ends of the simple rods, and a second group of playing piece rods having a length less than the distance between said opposite playing surfaces, whereby when inserted only the player inserting said playing piece rods can view the rod; and

(d) marker pieces made of a ferromagnetic material, ferromagnetic material also located at least centrally between each grouping of four apertures on each of said playing surfaces on the inside playing surface of said hollow cube, whereby when said marker pieces are placed upon the outside playing surface of said hollow cube, and centrally between four of said apertures, said markers will adhere thereto due to attractive forces of magnetism.

4,550,917
BOARD RACING GAME

Michael J. Ferris, Chicago, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chcago, Ill.

Filed Sep. 27, 1983, Ser. No. 536,376
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—246 16 Claims

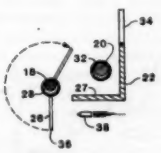


1. A board racing game comprising:
a game board having a track first, second, and third segments;
the first and third segments being offset with respect to each other;
the second segment being intermediate the first and third segments with one end of the second segment adjacent the first segment and the other end adjacent the third segment;
the second segment being shiftable between a first position in which the one end is aligned with the first segment and a second position in which the other end is aligned with the third segment;
player tokens positionable on the segments for movement along the track; and
means for determining the movement of the player tokens.

4,550,918
TARGET ARRAY

Harold F. Motsenbocker, 15600 Morro Rd., Atascadero, Calif. 93422

Filed Jun. 18, 1984, Ser. No. 621,264
Int. Cl.[4] F41J 7/04
U.S. Cl. 273—385 7 Claims

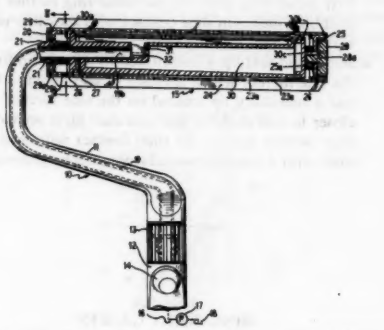


7. In a target apparatus that includes a target that is pendulously mounted for rotation about a laterally-extending axis the improvement comprising:
tube means; and,
shaft means extending laterally and through said tube means, said shaft means having a cross section appreciably smaller than the inside diameter of said tube means, whereby said tube means is pendulously supported by said shaft means;
said shaft means spaced far enough from the axis about which the target rotates that the target must push said tube means aside to rotate past said tube means, thereby transferring energy from the target to said tube means.

4,550,919
SEAL FOR A POWER FED ROLLER

Mark Snetting, Eden Prairie; Dan West, Crystal, and John R. Hacker, Burnsville, all of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Sep. 14, 1984, Ser. No. 650,898
Int. Cl.[4] F16J 15/34
U.S. Cl. 277—23 11 Claims

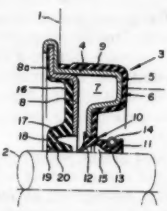


1. A seal for use with a rotatable part and a stationary part engaged therewith defining a volume therebetween filled with pigment-containing fluid, said rotatable part having an opening, said seal being disposed between said parts and adjacent said opening and consisting of resilient porous material having a selected porosity for simultaneously filtering said fluid by preventing passage of said pigment through said seal, substantially preventing leakage of unfiltered fluid through said opening, and having a selected resiliency and surface friction for permitting substantially unimpeded rotation of said rotatable part relative to said stationary part.

4,550,920
OIL SEAL WITH MAIN LIP, SUBSIDIARY LIP AND DUST LIP

Noboru Matsushima, Fukushima, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,661
Claims priority, application Japan, May 17, 1984, 59-73683[U]
Int. Cl.[4] F16J 15/32
U.S. Cl. 277—134 14 Claims



1. An oil seal which is disposed between a housing and a rotating shaft received in the hollow inside of said housing so as to prevent a liquid in said housing from leaking to the outside, said oil seal comprising:
a first metal ring which is secured at the outer peripheral portion thereof to said housing and is provided at the inner peripheral portion thereof with an annular seal lip which is in slide contact with the outer peripheral surface of said

rotating shaft thereby to seal said liquid in said housing; and

a second metal ring which is connected at the outer peripheral portion thereof to the outer peripheral portion of said first metal ring and is separated at the inner peripheral portion thereof from the inner peripheral portion of said first metal ring in the axial direction of said rotating shaft so as to form an annular space in cooperation with said first metal ring, said second metal ring further having a dust lip which is in slide contact with the outer peripheral surface of said rotating shaft,

wherein said seal lip is constituted by a main lip located on the side thereof which is closer to said liquid to be sealed and a subsidiary lip located on the side thereof which is closer to said dust lip, and said dust lip is provided in its slide contact surface for slide contact with said rotating shaft with a circumferentially continuous groove.

4,550,921

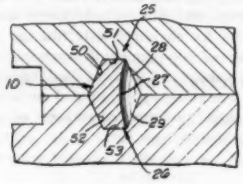
RING JOINT GASKET

Arnold M. Smith, 13023 Liggett St., Norwalk, Calif. 90650

Filed Mar. 12, 1984, Ser. No. 588,372

Int. Cl.[4] F16L *23/00*

U.S. Cl. 277—167.5 **7 Claims**



1. A ring joint gasket and flange assembly for sealing the joint between two flanges comprising:

a lower flange having a planar face with a groove formed therein, said groove having a flat inner surface, a flat bottom and a flat outer surface, said inner and outer surfaces being formed at an angle of about 23 degrees with respect to the vertical and the bottom surface being about parallel to the face of the flange;

an upper flange having a planar face abutting the planar face of the lower flange and having a groove formed therein, said groove being adjacent the groove in the lower flange and having a flat inner surface, a flat bottom and a flat outer surface, said inner and outer surfaces being formed at an angle of about 23 degrees with respect to the vertical and the bottom surface being about parallel to the face of the flange; and

a metallic ring joint gasket wedged in said groove of said lower flange and said groove of said upper flange, said ring joint gasket having two angled outer faces which faces are formed at an angle slightly less than that of the outer surfaces of the grooves when said ring joint gasket is in a relaxed configuration and said ring joint gasket having flat top and bottom surfaces which top and bottom surfaces abut said bottom surfaces of the grooves in the upper and lower flanges when the face of the upper flange abuts the face of the lower flange, and said gasket having a generally flat and generally vertical inner surface which inner surface is deflected in a slight concave manner by the force of the grooves which hold the gasket in place.

4,550,922

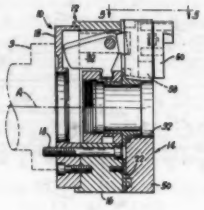
WORKHOLDER

William E. Hall, Solon; Edward D. Gailey, Mentor, and George J. Ovanin, Euclid, all of Ohio, assignors to The S-P Manufacturing Corporation, Cleveland, Ohio

Filed Aug. 23, 1982, Ser. No. 410,258

Int. Cl.[4] B23B *31/12*

U.S. Cl. 279—119 **15 Claims**



1. A power operated workholder assembly comprising a power subassembly and a workholding subassembly separable to permit removal of the workholding subassembly as a unit from the power subassembly without disassembly of either; the power subassembly comprising a first body and power actuable means movable relative to said first body for exerting a force when actuated; the workholding subassembly comprising a second body and work gripping means carried by the second body movable relative to the second body; said power-actuable means and said work gripping means being releasably interengaged to transmit force between the two and disengageable through relative movement of the first and second bodies to allow separation; and means integral with each body to separably retain the first and second bodies tightly together in response to relative movement of the two bodies.

4,550,923

FUEL SUPPLYING MEANS INSTALLED ON A LATERAL CROSS MEMBER OF A VEHICLE

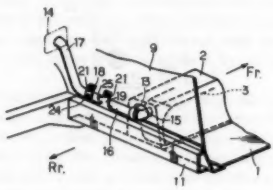
Hisashi Ogawa, Okazaki; Yasushi Tanaka, and Yoshimitsu Sato, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 8, 1984, Ser. No. 578,119

Claims priority, application Japan, Feb. 28, 1983, 58-028498

Int. Cl.[4] B60K *15/04*

U.S. Cl. 280—5 A **18 Claims**



1. A vehicle body, having a floor tunnel longitudinally extending in the vehicle, a cross member laterally extending across the vehicle at a position under the floor tunnel, a means for supplying fuel into a fuel tank provided underneath and within the floor tunnel, and article means for filtering fuel and absorbing evaporated fuel, said vehicle body comprising:

an inner filler pipe having a first end and a second end, the first end connected to the fuel tank and the pipe extending toward the rear of the vehicle to a position which is vertically above the lateral cross member;

an outer filler pipe having a first end and a second end, the

first end comprising an inlet port for accepting fuel therein and the second end of said inner filler pipe, the outer filler pipe extending substantially along the laterally extending cross member and substantially above said lateral cross member;

means for connecting the second end of the inner filler pipe with the second end of the outer filler pipe;

means for fastening the outer filler pipe to the vehicle body, said outer filler pipe located between the vehicle body and said fastening means; and

an engagement device mounted on said fastening means, said engagement device holding said article means on said fastening means.

4,550,924

HAND-OPERATED CART

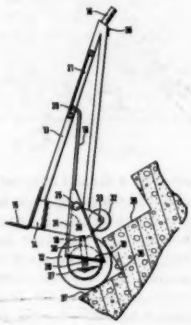
Ulrich Alber, 7470 Albstadt, 16-Laufen, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,980

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226294

Int. Cl.⁴ B62B 5/02

U.S. Cl. 280—5.28 **11 Claims**



1. A uniaxial hand-operated cart, comprising a traveling body including a platform and two coaxial running wheels; a load-carrying portion connected to said traveling body and including grips, a board to receive a load being transported, two opposite side walls and two coaxial supporting wheels rotatably supported on the respective side walls, and means for adjusting the cart to be moved along a staircase in upward and downward direction, said means being driven by an electric motor switchable in two opposite directions of rotation and mounted on said platform and including a battery electrically connected to said motor, a transmission gearing connected to said motor and a crank drive mounted on the traveling body and coupled to said transmission gearing, said crank drive including two crank pins engaging said side walls, respectively so as to permit an adjustment of a relative position of the traveling body and the load-carrying portion to each other and thus to permit the rest position of the cart and the movement of the cart along the staircase.

4,550,925

BOAT DOLLY

Stephen L. McDonough, 12242 Dayton Ave. N., Seattle, Wash. 98133

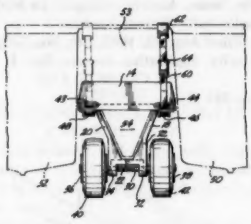
Filed Nov. 2, 1983, Ser. No. 547,862

Int. Cl.⁴ B62B 1/14

U.S. Cl. 280—47.13 B **14 Claims**

1. A boat dolly for use in conjunction with a boat of multihull construction, said boat including a right hull portion, a left hull portion, and a center hull portion joining said right and left hull portions, to define a tunnel between said right and left hull portions, a transom at the rear of said hull portions of said boat, and said boat further including a longitudinally extending center skeg, depending downwardly from said center hull portion within said tunnel, said right, left, and center hull portions and said skeg cooperating to define right and left channels on either side of said skeg, each channel having an upper surface defined by a bottom surface of said center hull portion, said dolly comprising:

elongate first and second arms substantially parallel to one another and constructed and arranged such that each arm is of a size to form an interference fit within an associated one of said right and left channels, each of said first and second arms including an upper surface shaped to con-



form to the upper surface of its associated channel such that the boat is firmly but releasably held on said dolly by the interference fit beteen said arms and said channels;

a backplate affixed to a first end of each of said first and second arms in orthogonal relation to said arms, said backplate constructed and arranged to abut the transom of said boat when said boat is on said dolly;

a first support yoke depending from said first and second arms, said first support yoke being shaped correspondingly to the shape of said skeg and adapted to closely receive said skeg; and

a pair of wheels rotatably mounted on said support yoke.

4,550,926

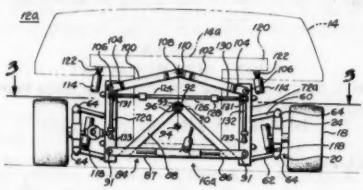
VEHICLE SUSPENSION SYSTEM

William L. MacIsaac, 7911 40th Ave. West, Everett, Wash. 98203

Filed Mar. 28, 1984, Ser. No. 594,329

Int. Cl.⁴ B62D 9/02

U.S. Cl. 280—112 A **31 Claims**



1. A suspension system for a vehicle having a body, comprising:

(A) vehicle support means on opposite sides of the body;

(B) spring means to nominally carry substantially all of the weight of the body on said vehicle support means; and

(C) tie assembly means interposed between said vehicle support means and the body, said tie assembly means having:

first means for pivotally interconnecting said tie assembly means and the body about along a longitudinal roll axis disposed at an effective elevation above the reaction center whereby as the vehicle negotiates a curve, the resulting centrifugal force acting on the vehicle tilts the

body toward the center of the curve relative to said tie assembly means and

second means for interconnecting said tie assembly means to said vehicle support means to permit the roll axis defined by said first interconnection means to shift laterally outwardly relative to said vehicle support means in the direction away from the center of the curve that the vehicle is negotiating thereby precluding the roll axis from serving as the reaction center of the vehicle.

4,550,927

FRAME FOR TWO-WHEELED VEHICLES

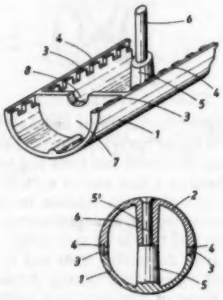
Peter Resele, Graz, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Aug. 23, 1983, Ser. No. 525,633

Claims priority, application Austria, Sep. 1, 1982, 3274/82

Int. Cl.⁴ B62K *3/02*

U.S. Cl. 280—281 R **15 Claims**



1. A frame for a two-wheeled vehicle, comprising a pair of semimonocoques consisting of light metal diecastings and having adhesively joined adjoining edges, the semimonocoques having longitudinally profiled, interengaging portions along said adjoining edges, each of the semimonocoques is integrally formed with an internal boss having an end face abutting the end face of a corresponding boss of the other semimonocoque, the abutting internal bosses extending diametrically through the joined semimonocoques, and an elongated fastening element attached to one of the bosses and passing through the other boss for connecting the semimonocoques.

4,550,928

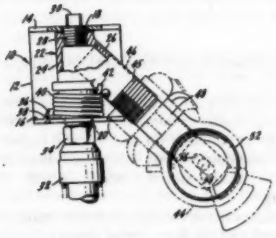
FRONT AIR SWINGAWAY

Arthur A. Berg, Northbrook, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Jun. 15, 1984, Ser. No. 621,214

Int. Cl.⁴ B60D *7/04*

U.S. Cl. 280—421 **10 Claims**



1. In a front air swingaway for connecting an air supply to the front of a trailer in a tractor-trailer combination, a bracket constructed and arranged to be mounted on the front of the trailer, a body member pivotally mounted on the bracket about a vertical axis and having two connections, one for connection to the source of air supply on the trailer, and the other for connection to the trailer's air system, the other connection extending beyond the periphery of the bracket and being movable when the body member is pivoted on the bracket, and a spring on the bracket for biasing the body member about its pivot so that the other connection extending beyond the periphery of the bracket will be releasably urged against the front of the trailer when it is not in use.

4,550,929

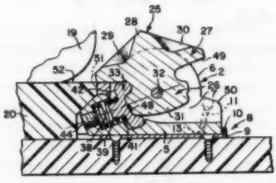
SKI BOOT HEEL BINDING

G. Theodore Buel, 30 Market Sq., Knoxville, Tenn. 37902

Filed Aug. 10, 1983, Ser. No. 521,838

Int. Cl.⁴ A63C *9/084*

U.S. Cl. 280—614 **11 Claims**



1. A binding carried by a ski and adapted to cooperate with a ski boot heel including, a binding main body having a base affixed atop a ski and provided with a forward nose section, a pivot member mounted above said base displacable between locked and unlocked positions, said pivot member having an upper actuating section and a lower cam section, wedge-shaped means adjacent the rear of the boot heel adapted to receive said forward nose section, said lower cam section including a cam face having locking means thereon, a rigid latch member, a spring engaging said rigid latch member to provide a biasing force to urge said latch member against said cam face, adjusting means manipulatable to alter the biasing force as provided by said spring, said spring and adjusting means disposed in said forward nose section, and a forward retainer shoulder on said pivot member upper actuating section adapted to overlie said heel wedge-shaped means when said pivot member is displaced to said locked position whereby, said latch member engages said locking means to maintain said locked position.

4,550,930

GOLF CADDY

John D. Proffit, Rte. 12, Box 150, Clarksville, Tenn. 37040

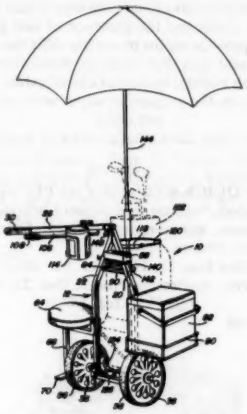
Filed Oct. 28, 1983, Ser. No. 546,298

Int. Cl.⁴ B62B *1/04*

U.S. Cl. 280—655 **12 Claims**

1. A golf cart including an upstanding frame having front and rear facing sides and laterally spaced generally parallel opposite side portions, opposite side ground engageable support wheel means, journal means journalling said wheel means from the lower ends of said opposite portions, an upper portion of said frame including a mount, and an elongated handle arm including base and handle defining ends, pivot means pivotally attaching said base end to said mount for swinging of said arm through a vertical plane between a depending retracted position generally closely paralleling said frame and a forwardly and upwardly incilned position projecting forwardly of said frame, means supported from said frame rearward of the latter for supporting a plurality of upstading golf clubs therefrom, each of said opposite side portions including a horizontally

elongated support member, means mounting said support members from said side portions for vertical swinging about horizontal front-to-rear extending axes between operative horizontally outwardly projecting positions and raised inoperative positions projecting upward along said side portions, said support members, when in said operative positions, projecting horizontally outwardly beyond the corresponding wheel means, one of said horizontally elongated support members defining a table upon which a cooler may be placed and the other support member defining a seat, said other support member including a vertically swingable depending support leg mounted from its outer end, said support leg being swingable to a retracted position closely underlying said other support member, said leg, when said other member is in the operative position, including a lower end spaced considerably outward of and horizontally registered with the lower periphery of the adjacent wheel means, said journal means including means operative to adjustably axially shift said adjacent wheel means relative to said frame outwardly toward the lower end of said leg.



4,550,931

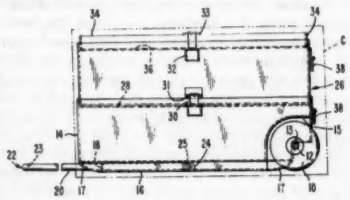
WHEELED CONTAINER, ESPECIALLY FOR USE BY FIRE-FIGHTING AND RESCUE SQUADS

Theodore Ziaylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067

Filed Sep. 26, 1983, Ser. No. 536,131

Int. Cl.⁴ B62B *1/12*

U.S. Cl. 280—655 **6 Claims**



1. A wheeled container, especially for use by fire-fighting and rescue squads and intended for compact storage when not in use in a compartment of a fire-fighting or rescue vehicle, comprising:

(a) a base container including

(1) a box-like receptacle adapted to hold a quantity of articles used in fire-fighting and rescue operations,

(2) a pair of ground wheels mounted in recessed positions on said receptacle at one end thereof, and

(3) handle means mounted on the receptacle for movement between recessed and extended positions; and

(b) a cover removably supported upon and adapted to close said receptacle, said receptacle, cover, wheels, and handle means forming a generally rectangular assembly adapted to be disposed, when not in use, in a correspondingly shaped storage compartment of a fire-fighting or rescue vehicle, the handle means being in the form of a U-shaped member having side rails, the base container including a pair of tubes telescopically, slidably receiving the respective side rails, the base container further including a pair of skids mounted on the underside of the base container receptacle, the skids being in side-by-side relation to the side rails of the handle means, the base container including plungers mounted in the skids and adapted to releasably maintain the handle means in its extended position.

4,550,932

DEVICE FOR TRANSVERSELY MAINTAINING AN ANTI-ROLL BAR

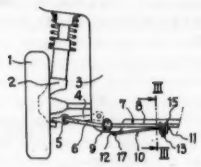
Claude Vilain, Montbeliard, and Gapp Noël, Dorans, both of France, assignors to Societe Anonyme Automobiles Peugeot, Paris and Societe Anonyme Automobiles Citroen, Neuilly-sur-Seine, both of, France

Filed Sep. 21, 1983, Ser. No. 534,277

Claims priority, application France, Sep. 23, 1982, 82 16041

Int. Cl.⁴ B60G *21/00*

U.S. Cl. 280—689 **15 Claims**



1. A device for maintaining a transverse anti-roll bar for a vehicle having a body structure, wheels and a suspension for the wheels which includes a transverse anti-roll bar, said device comprising two bearings for securing said roll bar to said structure of a vehicle, at least one tie for orienting roughly transversely of the vehicle, said tie being resiliently deformable in torsion and having a first end portion and a second end portion, means for securing the first end portion to the bar and means for securing the second end portion to said structure.

4,550,933

ADJUSTABLE ANCHORAGE

Michael Patterson, Carlisle, England, assignor to ASE (UK) Limited, Carlisle, England

Filed Apr. 5, 1983, Ser. No. 482,293

Claims priority, application United Kingdom, Apr. 8, 1982, 8210494; May 24, 1982, 8215103

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 280—808 **16 Claims**

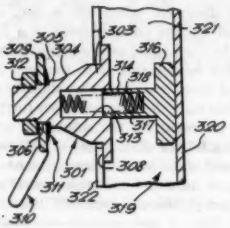
1. Adjustable anchorage means, comprising:

first means having a slot, said slot having at least one narrow slot portion joining spaced wider slot portions;

second means extending through said slot, said second means having a base portion which is wider than said wider slot portions, an intermediate portion receivable in said wider slot portions but not receivable in said narrow slot portion, an outer portion receivable in said narrow slot portion and a portion between said intermediate and outer portions which tapers inwardly in the outward direction from a width greater than the width of said narrow slot portion to the width of said outer portion; and

biassing means acting to said bias said second means into a

position in which said intermediate portion is received in a said wider slot portion but to allow movement of said second means against said bias to a position in which said



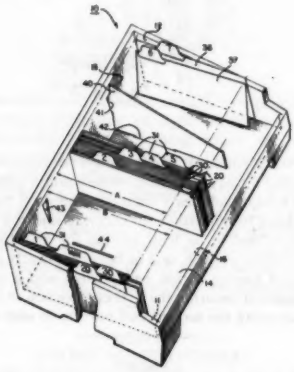
outer portion is received in said slot, whereby said second means is movable along said slot relative to said first means for adjustment of said anchorage means.

4,550,934

TICKLER SYSTEM WHEREIN AN ITEM OF DATA IN CARD FILE IS READILY ACCESSIBLE BY EITHER OF TWO CRITERIA, SUCH AS DATE AND SUBJECT MATTER

Levi H. Goossen, 224 E. 7th St., Newton, Kans. 67114

Filed Jun. 2, 1983, Ser. No. 500,354
Int. Cl.⁴ B42F *17/00, 21/00;* **A47B** *63/00*
U.S. Cl. 283—37 **5 Claims**



1. In combination, an open top tray of generally rectangular configuration; having bottom, sides and ends:

means for supporting said tray on and above a horizontal surface with the tray slanted sideways with respect to said horizontal surface;

a series of rectangular index cards of a given height and given width standing edgewise on the bottom of said open top tray;

a tab arising from the top edge of each index card;

a series of rectangular data slips of nominally the same height as said index cards and of width greater than said given width by a given margin width, said data slips also standing edgewise on the bottom of said open top tray;

said index cards and said data slips being intercalated;

the amount of said sideways slant being sufficient to urge index cards and data slips to individually settle, while standing edgewise on said bottom, against the lower slanted side of said open top tray;

the interior distance between the said side walls being greater than the width of the data slips by a given clearance distance;

whereby the lower side edges of said index cards and data slips tend to be in alignment with each other and with said lower side; and

whereby the upper side edges of said data slips tend to be aligned and to project beyond the upper side edges of said index cards by the said given margin width;

whereby the said upstanding tabs provide means to search said data slips in accordance with one system of classification in accordance with indicia on said tabs and

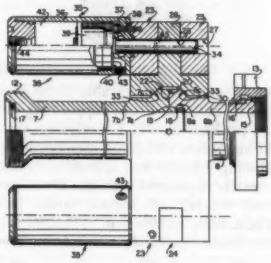
whereby the portions of said data slips which project beyond the index cards and the presence of said given clearance distance provide means to readily riffle the said upper side edges of said data slips to locate items classified in accordance with another system of classification, in accordance with data on the projecting upper side edges of said data slips.

4,550,935

QUICK-RELEASE COUPLING

Lloyd B. Marshall, Sorbiers, and Faycal Ghebrid, Saint-Etienne, both of France, assignors to Etudes et Fabrication Dowell Schlumberger, France

Filed Dec. 21, 1982, Ser. No. 451,538
Claims priority, application France, Dec. 23, 1981, 81 24461
Int. Cl.⁴ F16L *35/00*
U.S. Cl. 285—18 **6 Claims**



1. A quick-release coupling, comprising:

(A) mating male and female tubular members, the male tubular member being for fitting tightly into the female tubular member in a joining area and each tubular member having, on a respective side of said joining area, a respective truncated face; and

(B) a locking member for releasably locking said tubular members together, said locking member including:

(1) first and second transverse jaws located primarily on opposite sides of a junction, each said jaw being provided at its ends with engaging means which cooperate with complementary engaging means on the other said jaw when said jaws are placed together into operative engagement with one another, each said jaw including a semi-circular recess having truncated side faces adapted to come into abutment with the truncated faces of said tubular members so as to prevent said tubular members from separating from one another along the longitudinal axis of said tubular members when said jaws are in operative engagement with one another, openings formed in said jaws which define first and second longitudinal openings extending parallel to said longitudinal axis, each said opening including a portion associated with said first jaw and a portion associated with said second jaw;

(2) first and second movable locking fingers extending through said first and second openings, respectively, for locking said jaws in operative engagement with one another; and

(3) control means for moving said fingers between a locking position wherein said jaws are locked together and a disconnecting position wherein said jaws are free to release from one another.

4,550,936

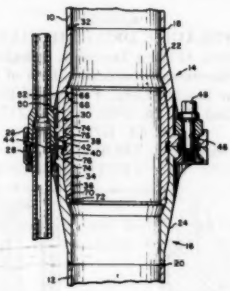
MARINE RISER COUPLING ASSEMBLY

John A. Haeber, Fillmore; John K. Rains, Ventura; Brad D. Beitler, Ojai, and George S. Kukuchek, Ventura, all of Calif., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Apr. 26, 1983, Ser. No. 488,836

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—26 **19 Claims**



1. A coupling assembly, for a marine riser subject to high tension and bending loads comprising:

a first coupling having a tubular portion welded to a riser pipe section, and a flange portion integral with the tubular portion;

a second coupling having a tubular portion welded to a riser pipe section, and a flange portion integral with the tubular portion;

the tubular portions of each coupling having a portion of the inside diameter greater than that of the riser section;

the tubular portion of at least one of said couplings having a box retaining groove around the inner periphery of the tubular portion;

fastening means for fastening said flange portions together in mutually contacting relationship;

a tubular pin insert, having the outside of each end substantially conforming to the inside shape of a corresponding tubular portion, and locatable entirely within the tubular portions;

at least one sealing means for radially sealing between said pin insert and a corresponding tubular portion on each end of said insert;

a pin retaining groove located on the outside periphery of said pin insert; and

a retaining ring located in said pin retaining groove and movable outwardly partially into said box retaining groove when said pin insert is located within a coupling, whereby said pin insert is loosely retained within one of said couplings.

4,550,937

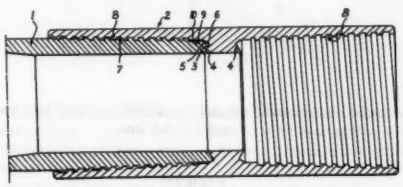
JOINT FOR STEEL TUBES

Jean Duret, Aulnoye-Aymeries, France, assignor to Vallourec S.A., Paris, France

Continuation of Ser. No. 881,259, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 583,831, Jun. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 370,146, Jun. 14, 1973, abandoned. This application Dec. 10, 1979, Ser. No. 102,135

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—334 **16 Claims**



1. An oil well pipe joint resistant to embrittlement by corrosive oil well fluids comprising a male pipe member and a female pipe member having mating threads of trapezoidal section adapted to be repeatedly assembled and disassembled, said female member having an internal shoulder and an external surface, said male member having a tip and a seal being formed between said shoulder and said tip, said shoulder defining an annular recess having a radially inner side in the shape of a truncated cone the largest diameter of which is at the bottom of the recess, and an outer side having the shape of a truncated cone the smallest diameter of which is at the bottom of said recess, the tip of said male member terminating in surfaces having substantially the same conicity as the inner and outer sides of said recess, and mating frusto-conical threaded sections inside the end of said female member and on the outside of the end of said male member, the nominal radial dimensions of the threads on said sections being such that when said joint is fully made up there is a nominal radial clearance between each threaded part of the male member and the corresponding threaded part of the female member, the said nominal radial dimensions being chosen such that with the applicable tolerances the maximum clearance between the threads on the male member and the corresponding threads on the female member is 0.3 mm per 100 mm of pipe diameter and the instances of interference are sufficiently minimal to avoid substantial hoop stresses in the female member, whereby said external surface of said female member and said internal surface of said male member are highly resistant to corrosion embrittlement in use in an oil well.

4,550,938

FISHING LINE KNOT

Hitoshi Nakanishi, Hyogo, and Hiroyuki Ogura, Kyoto, both of Japan, assignors to Yotsuami Limited, Hyogo, Japan

Filed Jul. 12, 1984, Ser. No. 630,225

Claims priority, application Japan, Jul. 25, 1983, 58-116001[U]

Int. Cl.[4] D04G *5/00*; B05G *1/18*

U.S. Cl. 289—1.2 **6 Claims**

1. A method of forming a fishing line connection comprising inserting one end of a first fishing line and one end of a second fishing line respectively into one and the other ends of a tubular line and forming a connection between said one end of each fishing line and each end of said tubular line, therein character-

ized that said connection is provided by forming each end of said tubular line into a single knot to correspondingly form said

one end of one of said first and second fishing lines into a single knot within said knot of said tubular line.

4,550,939

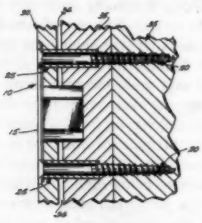
SECURITY STRIKE ASSEMBLY

John H. Babb, Jr., Grand Rapids, Mich., and Robert A. Marotto, Auburn, Ala., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Jun. 13, 1983, Ser. No. 503,819

Int. Cl.[4] E05C *21/02*

U.S. Cl. 292—340 **8 Claims**



1. A forced entry inhibiting strike plate assembly in combination with a door jamb and door support framing comprising:

a strike plate having an enlarged opening to receive a lock bolt, and smaller openings to receive fastener screws;

elongated fastener screws for mounting said strike plate;

mounting apertures extending into said framing a predetermined distance to form shoulders at the bottoms of said mounting apertures;

elongated rigid bushings extending from said strike plate through the door jamb, and being closely received in the mounting apertures in said door support framing, with the ends of said bushings abutting the shoulders of said mounting apertures;

and said screws extending through said bushings and threaded into said door support framing.

4,550,940

PALLET-BAR LIFT AND SUPPORT APPARATUS

Glen E. Schweikert, 29327 Edgewood Rd., San Juan Capistrano, Calif. 92675

Filed Jan. 27, 1984, Ser. No. 574,469

Int. Cl.[4] B66C *1/22*

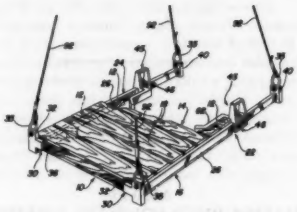
U.S. Cl. 294—67.4 **7 Claims**

1. A bar-lift and support apparatus for cargoe pallets including a pair of allochirally arranged lift-support units, each of said units comprising:

an elongated stabilizer bar adapted to be mounted along the oppositely disposed side-frame members of a pallet;

a first keeper means fixedly secured to one end of said stabilizer bar so as to be mounted about one end of each of said side-frame members;

a second keeper means slidably mounted for adjustable movement along said stabilizer bar and adapted to be mounted about the opposite end of each of said side-frame



members, whereby said pallet is secured between said first and second keeper means of each lift-support unit; and

means attached to said second keeper means for latching said second keeper means along said stabilizer bar; and

a shoulder plate affixed to the end of said stabilizer bar, and oppositely-disposed from said fixed keeper means.

4,550,941

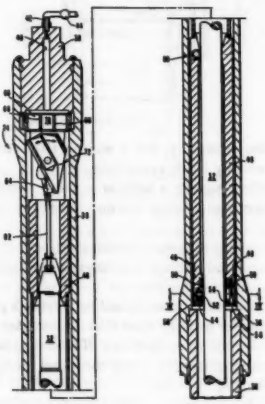
HYDRAULIC DRIVE MECHANISM

Luciano Veronesi, O'Hara Township, Allegheny County, and Donald G. Sherwood, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1980, Ser. No. 217,055

Int. Cl.[4] G21C *7/16*

U.S. Cl. 294—86.4 **9 Claims**



1. An hydraulic drive mechanism comprising:

a substantially elongated cylindrical drive housing;

a pivotable member pivotably attached to said drive housing and having a first slot, a first bore, and a second slot therein with each extending from the top to the bottom ends of said pivotable member with said first slot being defined along one edge of said pivotable member and extending into said first bore, with said first bore being defined adjacent to and substantially parallel with but not in colinear alignment with said first slot and having a ledge therein, and with said second slot being defined along the length of said first bore;

biasing means attached to said pivotable member for pivoting said pivotable member relative to said drive housing;

a contact member having a head on one end thereof with said head being capable of passing into said first bore and not being capable of passing through said first slot and said second slot, with said contact member being capable of being inserted through said first slot, said first bore, and said second slot and with said head being capable of being captured by said ledge in said first bore;

a drive shaft attached to said contact member and disposed within said drive housing for moving said head into contact with said pivotable member thereby pivoting said pivoting member relative to said drive housing thereby allowing said head to be inserted in said first bore while said contact member passes through said first slot thus latching said contact member to said pivotable member;

bearing means mounted on a substantially elongated cylindrical bearing housing and removably disposed within said drive housing and around said drive shaft for maintaining alignment of said drive shaft in said drive housing;

seal means removably attached to said bearing means and disposed in contact with said drive shaft for limiting the flow of an hydraulic fluid between said seal means and said drive shaft; and

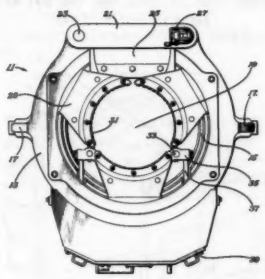
an hydraulic fluid source for providing said hydraulic fluid and connected to said drive housing for providing hydraulic pressure for moving said drive shaft relative to said drive housing, said bearing housing, said bearing means, and said seal means.

4,550,942

ELEVATOR/SPIDER WITH COUNTERBALANCE

Gunnar H. Berg, Austin, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Mar. 12, 1984, Ser. No. 588,188
Int. Cl.[4] E21B *19/10*
U.S. Cl. 294—102.2 **3 Claims**



1. An improved elevator/spider, comprising:

a body having a tapered bowl;

a series of slips, in the tapered bowl, reciprocally mounted to move between an upper, retracted position and a lower, gripping position;

a yoke, pivotally mounted to the body, and having a pivot point between a slip end and a spring end, wherein the slip end of the yoke is attached to the slips to raise and lower the slips;

a torsional spring, mounted on the body away from the pivot point of the yoke, to counterbalance the weight of the slips; and

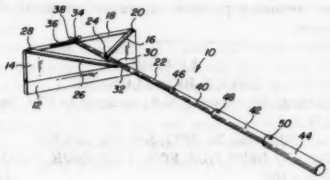
connector means for connecting the spring end of the yoke to the torsional spring.

4,550,943

SNOW REMOVER FOR AUTOMOBILES AND THE LIKE

Nicholas Mirto, 29 Cambridge Ave., Staten Island, N.Y. 10314

Filed Jul. 23, 1984, Ser. No. 633,517
Int. Cl.[4] E01H *5/02*
U.S. Cl. 294—54.5 **8 Claims**



1. A snow remover for automobiles and the like, comprising in combination:

(a) a rectangular solid one piece rigid base to which is attached a rubber scraper;

(b) a pivoting bar pivoted by a fastener to one end of the top surface of said rigid solid base the other end of which is pivoted by a fastener to one place at the end of a collapsible handle;

(c) a sliding bar one end of which is pivoted to the opposite end of said top surface of said rigid solid base from said pivoted bar, the other end of which is slidably connected by a fastener to a lengthwise slot in said collapsible handle; and,

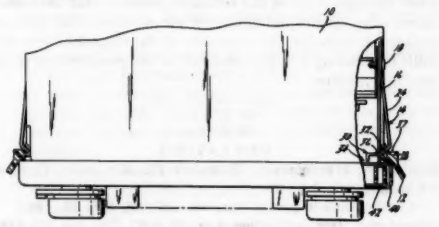
(d) a collapsible handle one end of which is slidably connected by a fastener to a lengthwise slot on said top surface of said rigid solid base; whereby when said collapsible handle is displaced in a direction away from said lengthwise slot on said top surface of said rigid solid base said collapsible handle folds against said rigid solid base.

4,550,944

RETAINER FOR RADIO RECEIVER

Frederick A. Simon, Ann Arbor, and Thomas H. Forcey, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 2, 1984, Ser. No. 585,684
Int. Cl.[4] B60K *35/00*
U.S. Cl. 296—70 **6 Claims**



1. A retainer system for securing a radio receiver in an automobile instrument panel having a generally rectangular aperture formed therethrough and for permitting withdrawing of the receiver from the aperture through engagement with a hand tool, the retainer system comprising:

A. means defining a plurality of access apertures sized to receive the hand tool through the instrument panel adjacent the lateral edges of the aperture; and

B. a plurality of unitary clip spring members, each including:

(1) a flat mounting portion secured to a side surface of the receiver;

(2) a spring arm portion bent outwardly from the fastening portion to define a normal position extending from the receiver beyond the width of the aperture and being

compressible to allow insertion through the aperture; and

(3) a panel abutting portion canted generally inwardly from the free end of the spring arm portion in registration with the access apertures to define an angled surface for abuttingly engaging the inner terminus of the aperture upon certain insertion of the receiver thereinto to a retaining position to prevent removal of the receiver.

4,550,945

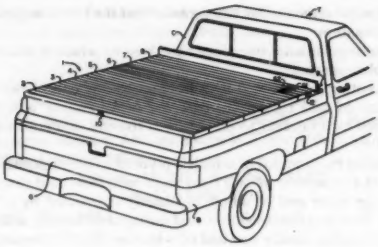
TRUCK BED CLOSURE

Paul Englehardt, Hawthorne, N.J., assignor to PEI, Inc., Hawthorne, N.J.

Filed Jul. 26, 1982, Ser. No. 401,818

Int. Cl.[4] **B60P** *7/02;* **E05C** *1/02;* **B60R** *25/00*

U.S. Cl. 296—100 **22 Claims**



1. A closure for a load container having a rectangular opening formed by side walls, the closure comprising: a plurality of elongated panels each configured to extend greater than the width of the rectangular opening to rest on two opposite side walls of a load container; means hingedly connecting the panels together side-by-side at longitudinal edges thereof for movement between an unfolded position wherein the panels lie in a single plane and completely close the opening and a fan-folded position wherein the panels lie substantially parallel to each other in a single stack superposed on one end panel; means for fastening said one end panel at a third side wall forming the rectangular opening of the load container; means disposed at the ends of each panel and depending therefrom when the panels are in the unfolded position, said last-named means being spaced just inboard of the associated side wall and engageable with the inner surfaces of the respective two side walls for limiting lateral movement of the panels when in the unfolded position.

4,550,946

VAN LAYOUT

Jacobus N. Hanemaayer, 75 Ardelt Pl., Kitchener, Ontario, Canada

Continuation-in-part of Ser. No. 348,695, Feb. 16, 1982, abandoned. This application Aug. 19, 1982, Ser. No. 409,549

Claims priority, application Canada, May 26, 1982, 403776

Int. Cl.[4] **B60P** *3/36, 3/38;* **B60R** *15/00;* **A47B** *61/00*

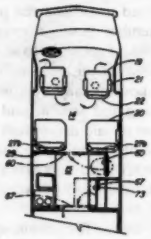
U.S. Cl. 296—156 **26 Claims**

1. A mobile van having a van body comprising:

(A) a plurality of main sections serially arranged in the lengthwise direction of the body and in close relation to one another;

(B) one of said sections having at least a substantial portion of a kitchen facility mounted adjacent one side-wall of the van body, a toilet region being defined adjacent the opposing side wall of the van body within said one section and a passageway aligned with the lengthwise dimension of the van and defined between the toilet region and kitchen facility, said passageway providing for communication between said one section and each other main section which is adjacent thereto;

(C) partition means associated with said one section and movable between (a) a first position clear of said passageway providing open communication between said one section and at least one other main section adjacent thereto whereby the combined spaces defined by said passageway, kitchen facility, and said at least one other section are available for communal use and (b) a second extended position across said passageway and separating said one section from said at least one other main section thereby forming separated compartments and converting



said one section into a segregated compartment to enable said toilet region to be used in privacy, and

(D) said partition means being adapted to at least partially cover and conceal said toilet region from view and block the use thereof when in said first position to enable the kitchen facility to be used while the toilet region is at least partly concealed, and said partition means further adapted to expose said toilet region for use within the thus converted compartment when in said second extended position so that a free open space defined at least in part by said toilet region and said passageway becomes accessible for use within the thus converted and segregated privacy compartment.

4,550,947

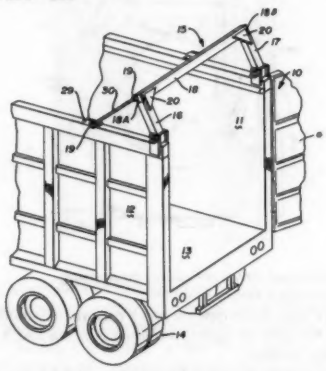
MOVABLE REAR CROSS BAR

Howard Booher, P.O. Box 277, Randolph, Ohio 44265

Filed Mar. 21, 1984, Ser. No. 591,931

Int. Cl.[4] **B62D** *25/00*

U.S. Cl. 296—181 **4 Claims**



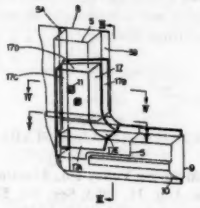
1. A movable cross bar for holding the side walls of a horizontal discharge trailer in vertical position and providing increased clearance for material discharged comprising a pair of spaced members having a cross member secured therebetween, each of said spaced members being pivotally secured to one of said side walls of said trailer, restraint means on said cross member restricting the arcuate movement of said spaced members, means for reinforcing said cross member and said spaced members to one another.

4,550,948

REINFORCED SIDE DOOR SUPPORT STRUCTURE

Makoto Hamada, Toyota; Junji Hasegawa, and Kuniaki Oosaka, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 12, 1983, Ser. No. 531,253
Int. Cl.⁴ B62D *27/02*
U.S. Cl. 296—202 **7 Claims**



1. A vehicle body and pillar-rocker panel reinforcement structure comprising:

a pillar having an inner pillar panel and an outer pillar panel, said outer pillar panel having inner edges which are fixed to the inner pillar panel;

a rocker panel including an inner rocker panel and an outer rocker panel, said outer rocker panel having inner edges which are fixed to the inner rocker panel and said inner rocker panel is fixed to said inner pillar panel and said outer rocker panel is fixed to said outer pillar panel;

a reinforcement member for reinforcing the pillar, said reinforcement member being located within a lower portion of said pillar and including a main wall fixed on an inner surface of said outer pillar panel, a skirt portion of said main wall fixed to the outer rocker panel, and an end wall fixed to the main wall at one end thereof and fixed to said inner pillar panel at another end thereof, thereby defining a substantially closed chamber within said lower portion of the pillar between the main wall of said reinforcement member, the end wall of said reinforcement member, the outer rocker panel, the outer pillar panel and the inner pillar panel; and

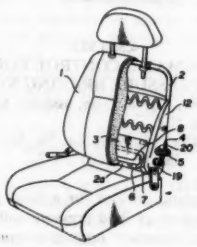
a side door supported swingably on said lower portion of said pillar.

4,550,949

LUMBAR SUPPORT DEVICE

Takao Sakamoto, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Sep. 30, 1983, Ser. No. 537,714
Int. Cl.⁴ A47C *3/00*
U.S. Cl. 297—284 **7 Claims**



1. A lumbar support device, comprising:

(a) a plate-shaped lumbar support member provided in the lower portion of a back frame;

(b) a swing frame pivotally mounting said lumbar support member such that said lumbar support member is free to pivot forwardly and rearwardly relative to said back frame;

(c) cam means for variably adjusting the angle of inclination of said swing frame relative to said back frame in a fore-and-aft direction; and,

(d) adjustment means for adjusting the inclination of said lumbar support member relative to said swing frame, wherein

said cam means includes (i) a cam shaft and a pinion shaft each projecting outwardly of said seat back, (ii) a cam fixed to said camshaft and being abutted against said swing frame, (iii) a pinion gear fixed to said pinion shaft, and (iv) a doglegged arm having one end coupled to said lumbar support member and another end integrally provided with a sector gear which is meshed with said pinion gear.

4,550,950

PORTABLE FURNITURE

Gregg Fleishman, Los Angeles, Calif.

Division of Ser. No. 123,903, Feb. 22, 1980, , which is a continuation-in-part of Ser. No. 866,837, Jan. 4, 1978, abandoned. This application Dec. 28, 1981, Ser. No. 335,064
Int. Cl.⁴ A47C *7/00*
U.S. Cl. 297—440 **1 Claim**

1. Portable furniture including furniture member means and a generally planar support member,

said furniture member means disposed generally horizontally and said support member disposed generally vertically,

said support member comprising integral main, tab and arm portions adapted to be resiliently disposed in angular relation,

said support member having upwardly facing portions supporting said furniture member means,

said furniture member means having separate interlocking means releasably engaging said main portion, said tab portion, and said arm portion for maintaining said angular relation,

said furniture member means and support member being selectively separable for portability by disengaging said interlocking means,

wherein both said tab portion and said lower arm portions are comprised to be relatively more flexible than the other portions,

wherein said furniture member is a chair seat,

wherein the outline of said support member is substantially rectangular and said main portion comprises the perimeter element of said rectangularly shaped support member providing support to the front of the chair,

said main portion shaped with a broad relatively more flexible upper area connecting to said arm portions at the bottom end,

said broad upper area allowing the tab portion to deflect resiliently rearwardly from the plane of the main portion providing resilient back support for the occupant seated therein,

said tab portion also having an upwardly facing notch at the

bottom of the broad area to support the rear of the seat member,

the lower area of said tab portion providing support to the rear of the chair and connecting to the arm portions as already said,

the arm portions having a broader relatively more flexible lower area allowing it to bend angularly forward and a narrower linear upper area the length of said upper area such that when bent forward in its assembled mode it crosses over the main portion and continues on to support the front of the seat,

said upper area of said arm portions also having two sets of notches,

the lower of the two said notches located on the outer edge of said arms connecting to the prior mentioned notches on the inner edges of said main portions whereas, the location of said notches is such that when interlocked they serve to maintain the support member in its bifurcated mode,

the upper of said notches at the ends of the arm portions connects to the sides of the seat at its front edge, and

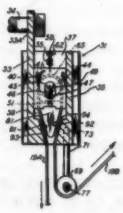
said seat of said furniture is also shaped substantially rectangularly with notches at the front of the sides edges for connection to the arm portions, wings at the rear of the side edges to hook behind the main portion and be supported on the ledges, and ears at the rear which interlock with the tab portion.

4,550,951

MOMENTUM RESPONSIVE VEHICLE SHOULDER HARNESS LATCH

Edward W. Apri, 998 Lehigh St., Altadena, Calif. 91001

Filed Feb. 18, 1983, Ser. No. 467,512
Int. Cl.[4] A62B *35/02;* **B60R** *21/10*
U.S. Cl. 297—480 **5 Claims**



1. In a momentum responsive shoulder harness apparatus for use in securing a passenger with respect to a seat in a vehicle having side walls and a floor to which the seat is secured and having a lap belt fixed at one end to the vehicle and releasably secured to a lap belt portion extending from a first belt take-up reel fixed to the vehicle and a shoulder harness belt secured at one end to said lap belt and at its other end to a second take-up reel fixed to the vehicle, the combination comprising a belt arresting latch, a latch housing securable to a wall of the vehicle at a point

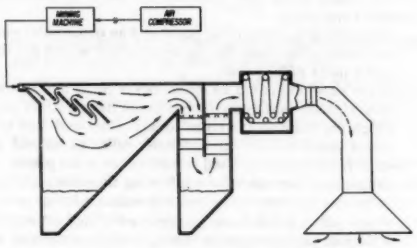
displaced from the passenger seat, said latch housing having a back wall adapted ti be fixed to a vehicle side wall, a front wall spaced from the back wall away from the vehicle wall, latch housing end walls spaced from each other and at right angles to the back and front housing walls, said front, back and end walls defining a housing volume adapted to contain a bight of the shoulder harness belt between the lap belt and the second take-up reel, a roller over which said bight passes within said housing, a roller cradle in the housing volume supporting the roller, first resilient means in the cradle journalling said roller, a slanting back wall portion a slanting front wall portion, said slanting wall portions tending to converge at the bottom of said housing, a wedge fixed to said cradle and diminishing toward the bottom of the housing, portions of the harness bight passing on opposite sides of the wedge between the wedge and the back and front wall slanting portions such that downward displacement of the wedge between said slanting wall portions imposes a binding force upon said shoulder harness belt within the latch housing, second resilient means suspending said cradle and wedge within the housing volume, the resistance to force of said first and second resilient means being of different degree, whereby to provide free adjustment of the belt at low forces and controlled movement of the belt at higher forces and substantially no movement of the belt at substantial force levels.

4,550,952

MINING MACHINE WITH ADJUSTABLE HOOD-SCOOP ASSEMBLY

Harvey Hall, 2680 Spring Valley Rd., Huntington, W. Va. 25704

Filed Aug. 31, 1983, Ser. No. 528,061
Int. Cl.[4] E21C *27/24*
U.S. Cl. 299—64 **19 Claims**



1. A pneumatic coal mining machine which comprises:

(a) a longitudinal mobile chassis having a pressurized air inlet means and a vacuum outlet means at one extreme of said chassis;

(b) pneumatic coal removal and pulverization means at opposite extreme of said chassis to remove coal from a face of coal;

(c) an adjustable hood-scoop situated surrounding the substantially complete perimeter in juxtaposition with respect to said removal and pulverization means said scoop comprising four separate plates, each of which has its position individually changed with respect to the perimeter of the seam of said coal being mined; and

(d) a vacuum conveyor means for extraction of substantially all of said coal removed from said face and for removal of indigenous gases created by said coal removal.

4,550,953

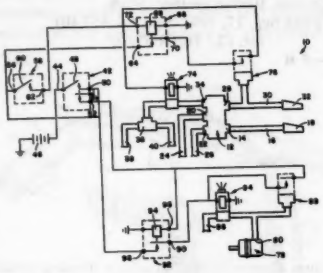
ELECTRO-PNEUMATIC CONTROL FOR A VEHICLE FLUID PRESSURE BRAKING SYSTEM

Roy E. Bartholomew, Elyria, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 16, 1983, Ser. No. 562,321
Int. Cl.[4] B60T *13/22*
U.S. Cl. 303—15 **18 Claims**

1. Electro-pneumatic control for a fluid pressure braking system having a source of fluid pressure and a fluid pressure device, said electro-pneumatic control comprising electrically actuated valve means controlling communication to said fluid pressure device from said fluid pressure source, switch means for controlling said electrically actuated valve means, and a pressure-responsive switching means responsive to the fluid pressure level at said fluid pressure device for maintaining

actuation of said electrically actuated valve means as long as the pressure level at said fluid pressure device is above a predetermined level after the pressure level at said fluid pressure device initially attains said predetermined level.



4,550,954

HYDRAULIC VEHICLE BRAKE SYSTEM

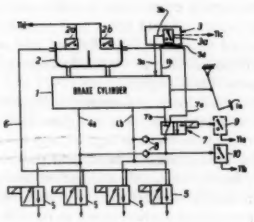
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,237

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3243019

Int. Cl.[4] **B60T** *17/18*

U.S. Cl. 303—92 **15 Claims**



1. A hydraulic vehicle brake system including a pressure source, at least one static brake circuit having a main brake cylinder, a piston actuated by a brake pedal, at least one brake pressure anti-skid control valve between said main brake cylinder and at least one wheel brake cylinder responsive to wheel locking for initiating pressure regulation, a return-flow line into a supply container for the pressure medium discharged by said at least one brake pressure anti-skid control valve, an external energy supply system, and a valve assembly responsive to regulation of the brake pressure effecting a switchover position for connecting said external energy supply system to said at least one brake pressure anti-skid control valve, the improvement comprising

a monitoring device responsive to actuation of said valve assembly for generating a signal when said valve assembly effects said switchover position, and

a blocking circuit included in a triggering means for said at least one brake pressure anti-skid control valve, said blocking circuit being connected with said monitoring device, whereby upon a tendency to skidding by at least one wheel, said blocking circuit, via said triggering means directs a signal to an associated brake pressure anti-skid control valve which actuates

said at least one brake pressure control valve into a brake pressure decreasing position for pressure reduction only whenever said monitoring device indicates that said valve assembly has switched over into a second switching position, via which said at least one brake pressure anti-skid control valve is supplied with pressure mediums from said pressure source.

4,550,955

PRETENSIONING ELEMENT FOR CIRCULATION TRACK BEARING MEMBER FOR LINEAR BEARINGS

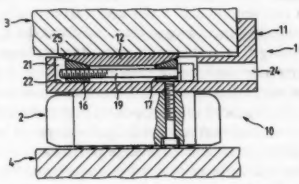
Erich Grabher, Dietlikon; Max Müller, Zürich; Horst Wetzel, Wettingen, and Robert Schultschik, Uster, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Oct. 26, 1984, Ser. No. 665,294

Claims priority, application Switzerland, Nov. 4, 1983, 5954/83

Int. Cl.[4] **F16C** *29/06, 23/06*

U.S. Cl. 308—6 C **5 Claims**



1. A pretensioning arrangement for a circulation track bearing member of a linear bearing translatably guiding a movable member of a machine in relation to lengthwise guide means of the machine, comprising:

a housing having means for securing the circulating track bearing member to said housing and means for mounting said housing to the movable member of the machine between the movable member and the lengthwise guide means of the machine for forming a circulating unit of the linear bearing;

said housing containing:

at least two guide tracks each extending in a lengthwise direction substantially parallel to the lengthwise guide means;

a first wedge member and a related second wedge member guided in each guide track of said at least two guide tracks for mutual displacement in said lengthwise direction;

each wedge member of said first and said second wedge members defining a respective therewith associated first wedge surface;

a tightening device arranged in each said guide track;

each said tightening device operatively engaging said first wedge member and said second wedge member for effecting a relative displacement therebetween;

at least one support plate for supporting said circulating unit on the movable machine member;

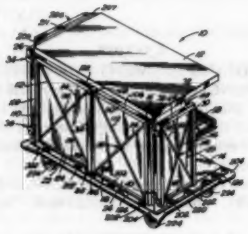
said at least one support plate defining two second wedge surfaces arranged to confront said first wedge surfaces of said first and second wedge members; and

said first wedge surfaces cooperating with said tightening means and with said second wedge surfaces for positionally adjustably supporting said housing and conjointly therewith the circulating track bearing member in relation to said support plate.

4,550,956
SURGICAL CASE CART

Robert J. Cohn, Dallas, Pa.; Frank C. Olsson, East Lyme, Conn.; James W. Holzman, New Tripoli, and Paul Santarelli, Hudson, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed Mar. 4, 1982, Ser. No. 354,762
Int. Cl.⁴ A47B *31/00*
U.S. Cl. 312—250 **15 Claims**



1. A cart comprising:

a container having a base, a top wall, a rear wall, opposing first and second side walls and a front wall;

said front wall including at least one front door panel having opposing first and second side edge portions;

said first side wall being divided to define a forward side door panel and a rearward fixed side panel, said forward side door panel having opposing first and second side edge portions, and said rearward fixed side panel having opposing first and second side edge portions;

said first side edge portion of said rearward fixed side panel being fixed to an adjacent side edge portion of said rear wall;

first hinge means hingedly coupling said first side edge portion of said forward side door panel to said second side edge portion of said rearward fixed side panel, said first hinge means permitting approximately 180 degrees of rotation for permitting movement of said forward side door panel between a first position in generally coplanar relation with said rearward fixed side panel and a second position overlying and in generally congruent mutally parallel relation with said rearward fixed side panel; and

second hinge means hingedly coupling said first side edge portion of said one front door panel to said second side edge portion of said forward side door panel, said second hinge means permitting approximately 270 degrees of rotation for permitting movement of said one front door panel among a first attitude constituting at least a portion of said front wall of said cart when said forward side door panel is in said first position, a second attitude overlying and in generally mutually parallel relation to said rearward fixed side panel and said forward side door panel when said forward side door panel is in said first position, and a third attitude overlying and in generally mutually parallel relation to at least a portion of said rear wall when said forward side door panel is in said second position;

whereby said container can be placed in a first open condition with said one front door panel in said second attitude rotated about said second hinge means toward said forward side door panel in said first position to provide access to an interior of said container, and whereby said container can be placed in a second open condition with said forward side door panel in said second position rotated about said first hinge means toward said rearward fixed side panel and said one front door panel in said third attitude rotated about said second hinge means toward said rear wall to provide both visibility and access to said interior of said container.

4,550,957
ELECTRICAL HOSE SWIVEL CONNECTOR FOR CANISTER VACUUM CLEANER

James W. Keane, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 17, 1984, Ser. No. 651,101
Int. Cl.⁴ H01R *39/00*
U.S. Cl. 339—5 R **20 Claims**

1. In a vacuum cleaner having a canister housing defining a suction inlet and an electrical power connector adjacent said inlet, and a hose for conducting dirt-laden air to said suction inlet and provided with electrical power conducting means, the improvement comprising:

a swivel connector having a first portion secured to said hose end, and a second portion adapted to be removably secured to said housing in said suction inlet, said first portion being swivelly connected to said second portion;

an electrical power plug mounted to said swivel connector second portion;

catch means associated with said housing adjacent said suction inlet;

a flexible electrically conductive pigtail having a first end electrically connected to said power plug and a second end electrically connected to said electrical power conducting means of said hose, said pigtail having a length preselected to permit swiveling of said swivel connector first portion relative to said second portion up to a maximum preselected angle;

latch means on said swivel connector disposed to releasably engage said catch means when the swivel connector second portion is received in said suction inlet to connect said hose end to said suction inlet, said power plug being disposed to have electrically connected association with said electrical power connector as an incident of said swivel connector second portion being so received in said suction inlet.

4,550,958
ELECTRICAL HOSE SWIVEL CONNECTOR FOR CANISTER VACUUM CLEANER

Orbert S. Smith, Baldwin Township, Sherburn County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 17, 1984, Ser. No. 651,102
Int. Cl.⁴ H01R *39/00*
U.S. Cl. 339—5 R **19 Claims**

1. In a vacuum cleaner having a canister defining a housing wall portion, and a suction hose having an end provided with a hose end and a power plug, the improvement comprising a swivel connector for removably connecting said hose end connection to said canister, said swivel connector comprising:

a tubular suction inlet fixedly mounted to the canister and having a distal portion projecting outwardly from said housing wall portion and defining a swivel axis;

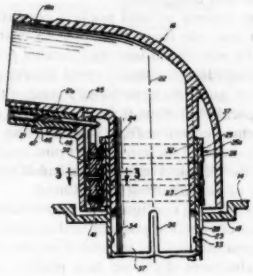
a plurality of longitudinally spaced electrically conductive commutator rings coaxially on said distal portion of the suction inlet, each ring having an electrically conductive connecting portion extending therefrom inwardly through said housing top wall portion into said canister for providing an electrical power connection therein;

a swivel member having a tubular insert portion coaxially rotatably retained in said tubular suction inlet, and a turned tubular outer end portion extending angularly to said insert portion for swinging 360° about said swivel axis

as an incident of rotation of said insert portion in said tubular inlet;

a plurality of electrical slide connectors on said tubular insert portion of the swivel member biased into sliding electrical contact one each with said commutator rings;

electrical power transfer means on said swivel member for



removably electrically connecting a hose power plug thereto;

means electrically connecting said electrical power transfer means to said slide connectors; and

means on said outer end portion of the swivel member for removably connecting a suction hose end connector thereto.

4,550,959

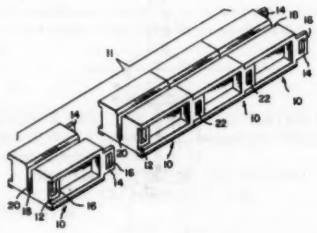
SURFACE MOUNTABLE COEFFICIENT OF EXPANSION MATCHING CONNECTOR

Dimitry G. Grabbe, Middletown, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 484,651, Apr. 13, 1983, abandoned. This application Nov. 20, 1984, Ser. No. 673,222

Int. Cl.[4] H05K *1/00;* **H01R** *13/504, 9/09*

U.S. Cl. 339—9 E **13 Claims**



1. An electrical connector housing for moving relatively with the expansion or contraction of the substrate upon which it is mounted, comprising:

at least two modular connector housing means having electrical contacts contained therein, said housing means joined to each other at one end thereof, and being disposed on a substrate or the like;

meltable filler material means inserted in an opening where said housing means are joined so as to secure said housing means to each other thereby forming a connector housing assemblage, characterized in that said meltable filler material means is meltable at a temperature substantially less than that of the modular connector housing means.

4,550,960

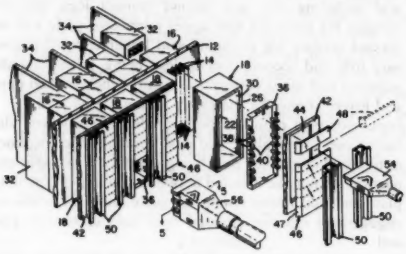
SHIELDED BACKPLANE ASSEMBLY

John C. Asick, Harrisburg; George H. Douty, Mifflintown; John M. Landis, Camp Hill; Clair W. Snyder, Jr., York, and James S. Staron, Dillsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 24, 1984, Ser. No. 643,942

Int. Cl.[4] H01R *13/648*

U.S. Cl. 339—14 R **6 Claims**



1. A totally shielded backplane assembly for receiving at least one connector comprises:

a backplane having a plurality of pins extending from one surface thereof in at least one array,

at least one shroud fixed against said one surface of said backplane, each shroud having sidewalls surrounding a respective pin array, said sidewalls forming a connector-receiving cavity having said pin array therein,

a metal gasket mounted on each shroud, each gasket having means for providing electrical continuity between a shielded connector received in said cavity and a conductive chassis panel,

a conductive chassis panel against said metal gasket, said panel having at least one aperture, each apertrue being aligned with a respective connector-receiving cavity,

a cover assembly on said panel over each pin array, each said assembly having a series of removable sections, said sections being selectively removable to expose pin terminals as desired for engaging said at least one connector.

4,550,961

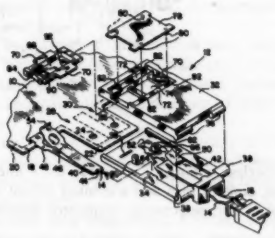
ELECTROSURGICAL ELECTRODE CONNECTOR

Frederick T. Aicher, Miamisburg; James R. Martin, Sr., Waynesville, and William T. Flanagan, Kettering, all of Ohio, assignors to NDM Corporation, Dayton, Ohio

Filed Jul. 26, 1984, Ser. No. 634,857

Int. Cl.[4] H01R *13/639*

U.S. Cl. 339—14 R **10 Claims**



1. A connector for connecting an electrical lead to a ground electrode of the type used with an electrosurgical generator, said electrode having a connection tab extending from the periphery thereof and defining an electrically conductive sur-

face on at least one side of said tab and further defining a connector engagement opening extending through said tab, comprising:

an upper connector plate formed of an electrically nonconductive material,

a lower connector plate formed of an electrically nonconductive material, said upper and lower plates each defining hinge connection means at first ends thereof for connecting said upper and lower plates together,

leaf spring contact means connected to said electrical lead and including first and second contact legs, said first contact leg engaging said upper connector plate and said second contact leg engaging said lower connector plate, said first and second contact legs being joined together adjacent said hinge connection means, whereby said upper and lower connector plates are spring biased apart,

a connector post mounted on the side of said lower plate facing said upper plate, said post defining an engagement notch, said connector post being sized such that said connection tab may be inserted between said upper connector plate and said lower connector plate and said connector engagement opening pressed over said connector post, and

spring biased latch means, slidably mounted on said upper connector plate, for engaging said connector post engagement notch when said upper and lower connector plates are pressed together, such that said upper and lower connector plates are held together, pressing said first and second contact legs against a connection tab held therebetween whereby said lead and said ground electrode are electrically connected.

4,550,962

SOLDERLESS ELECTRICAL CONNECTOR ASSEMBLY

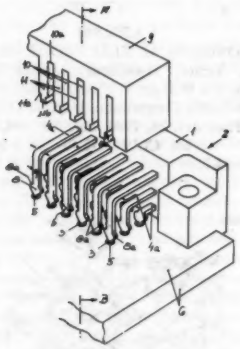
Franz Czeschka, Rechberghausen, Fed. Rep. of Germany, assignor to ERNI Elektroapparate GmbH, Adelberg, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,382

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318135

Int. Cl.⁴ H05K *13/04;* **H01R** *9/09*

U.S. Cl. 339—17 LC **1 Claim**



1. A solderless connector assembly for a multiple plug device having contact pins and a printed circuit board particularly useful in microelectronic connector assemblies comprising:

an insulating housing having a plurality of contact pins mounted therein, said contact pins being arranged in at least one parallel row;

connection posts on each of said contact pins having connection ends adapted to be, by movement in an inserting direction, inserted into printed circuit board holes and projecting freely from said housing;

a base portion on each of said contact pins extending perpendicularly to said connection posts;

an insertion tool adapted to engage said contact pins for inserting said contact pins into a printed circuit board and capable of being removed from engagement with said contact pins after completion of said insertion process;

said insertion tool comprising

a base area having parallel pockets consisting of inserting slots on one side thereof adapted to enable said contact pins to be introduced into said parallel pockets by movement of said insertion tool in said inserting direction, and

a plurality of guide ducts included in one of the sides of each of said parallel pockets opposite said one side, said guide ducts being accessible from said inserting slots and being shaped to receive therein contact pins located within each of said inserting slots upon movement of said insertion tool laterally of said inserting direction;

said guide ducts being configured to receive therein respective ones of said connection posts of said contact pins during an insertion process and to include portions arranged to be placed in abutment with said base portions of said contact pins in order to apply against said base portions a force inserting said connection ends into said printed circuit board holes when said insertion tool is moved in said inserting direction of said pins, said tool being adapted to be disengaged from said contact pins by lateral movement thereof in a direction opposite to the lateral direction of movement when receiving said contact pins in said guide ducts to bring said contact pins out of said guide ducts and back into said inserting slots.

4,550,963

ELECTRICAL CONNECTOR

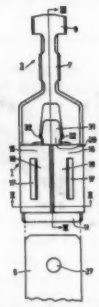
Johannes H. Moors, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,550

Claims priority, application Netherlands, Jul. 2, 1982, 8202668

Int. Cl.⁴ H01R *13/20, 13/11*

U.S. Cl. 339—31 R **3 Claims**



1. An electrical connector including a receptacle portion formed from sheet material for receiving an electrical terminal, said receptacle portion comprising a base, a pair of upstanding side walls terminating in end portions turned inwardly toward the base for engaging said terminal, and a resilient tongue rising from the base toward said end portions and extending rearwardly from a front portion of the connector into which the terminal is received, said tongue including an upwardly extending projection for cooperating with an opening in the terminal for securing said terminal in the connector,

wherein the improvement comprises a first pair of removable tags forced out of the base below the tongue, each tag

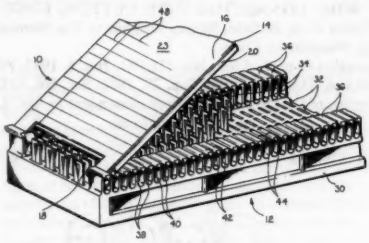
extending upwardly between the tongue and a respective one of the side walls, said tags being substantially parallel to the side walls, being spaced apart by a first distance approximately equal to the width of a first size terminal to be received in the connector, and extending to a height sufficient to prevent insertion of a terminal wider than said first distance, and said side walls being spaced apart by a distance approximately equal to the width of a second size terminal to be received in the connector.

4,550,964

HINGED COVER AND LABEL ASSEMBLY FOR CONNECTOR BLOCK

Norman Donais, Oakville, and Ronald Nitowski, Naugatuck, both of Conn., assignors to The Siemon Company, Watertown, Conn.

Filed Jul. 23, 1984, Ser. No. 633,403
Int. Cl.[4] H01R *13/447*
U.S. Cl. 339—44 M **20 Claims**



1. A connector block cover assembly, the connector block having a body portion with two fanning strips disposed along the longitudinal sides thereof, the fanning strips comprising a plurality of arms defining spaces therebetween, the arms each having an overhanging flat lip thereon, the lips spaced apart by slots, the cover assembly including:

lid means, said lid means having flat planar inner and outer surfaces to cover a least a portion of said connector block; and

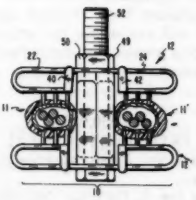
strapped hinge means attached to said lid means, said hinge means positioned between oppositely disposed spaces in each of said fanning strips wherein said cover freely pivots about said hinge means between open and closed positions.

4,550,965

CONNECTOR ASSEMBLY FOR INSULATED CABLE

Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Apr. 25, 1983, Ser. No. 488,305
Int. Cl.[4] H01R *4/24, 4/44*
U.S. Cl. 339—47 R **8 Claims**



1. A connector for electrical cable having a conductive sheath surrounded by an insulative jacket, said connector comprising:

a base for supporting said cable;

a conductive member movably secured to said base, said conductive member including a support surface; a cantilevered spring supported by said support surface including a first cantilevered portion extending from said support surface of said conductive member and a second cantilevered portion extending from an unsecured end of said first cantilevered portion back toward said support surface; a contact portion on said second cantilevered portion movably supported relative to said support surface; and contact portion including an insulation piercing contact for contacting said cable upon movement of said conductive member; said cantilevered spring formed to provide a predetermined force by said insulation piercing contact on said cable upon moving said conductive member towards said base, said predetermined force being greater than the resistance of said insulative jacket and less than the resistance of said conductive sheath; and

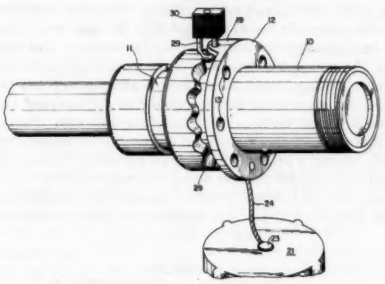
clamping means for moving said conductive member toward said base.

4,550,966

ELECTRICAL CABLE CONNECTORS

Roy C. Riley, North Tazewell, Va., assignor to J & R Manufacturing, Inc.

Filed Jan. 24, 1984, Ser. No. 573,371
Int. Cl.[4] H01R *13/639*
U.S. Cl. 339—84 **2 Claims**



1. An electrical cable connector for safe use with electric motor driven mine equipment in coal mines in which gassy conditions normally create great danger of explosion caused by incendive arcing or sparking, comprising,

a receptacle component having a cylindrical casing and an open end,

a plug component adapted to be partially inserted in the open end of the receptacle component,

means for securing and locking said components in joined operative position,

said means comprising a compression lock ring securely mounted on the outer exposed surface of said plug component and having locking threads thereon, and a mounting flange mounted on the outer surface of said receptacle component,

said mounting flange having a mounting sleeve with a threaded portion adapted to engage the locking threads on said compression lock ring, said mounting flange having a locking ear thereon,

said compression lock ring having a means adapted to be engaged by a leg of a padlock passed through the locking ear of the mounting flange whereby the components may be prevented from accidental uncoupling,

said sleeve having a series of radial bores therein, a series of set screws adapted to be received in said bores, whereby if the locking ear on the mounting flange becomes damaged,

the mounting flange may be replaced without the necessity of replacing the entire receptacle component.

4,550,967

ELECTRICAL CONNECTOR MEMBER

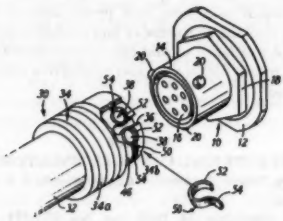
Arthur J. Riches, Herne Bay, and Brian Mitchell, Canterbury, both of England, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 8, 1982, Ser. No. 447,739

Claims priority, application United Kingdom, Dec. 14, 1981, 8137686

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 339—88 R **12 Claims**



1. An electrical connector member comprising a generally cylindrical shell member forming a housing for one or more electrical contacts and being provided with means for retaining the connector member on a mating connector member which carries generally radial bayonet pins, the said means including an axial passage for receiving each bayonet pin, and being such that the connector member can be coupled to and uncoupled from a mating connector member carrying bayonet pins by a sufficient axial force but is retained in the coupled condition against a weak force in the uncoupling direction, characterised in that the said means includes a plurality of resilient members each having a plurality of at least partially circular portions, each said circular portion being accommodated in a respective recess and each recess intersecting with the associated passage such that the said portions extend partially into the passage.

4,550,968

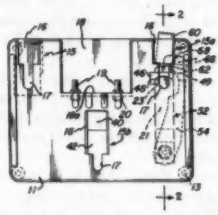
BATTERY PACK CONNECTION

John J. Corrigan, Washington, Conn., assignor to Anton/Bauer, Inc., Shelton, Conn.

Filed Oct. 12, 1984, Ser. No. 660,083

Int. Cl.⁴ H01R *13/639*

U.S. Cl. 339—91 R **10 Claims**



1. A releasable connection for a battery pack or the like comprising a relatively flat male plate and a relatively flat female plate, said plates being adapted to be releasably locked together in connected position; said female plate including a plurality of keyholes with each having an opening and a depending slot, and at least one elongate terminal, said terminal and keyhole slots being elongate in the same direction; said male plate including a plurality of spaced headed projections with there being one for each keyhole and with each projection having head and leg portions, and at least one elongated mating terminal; said male plate being positioned abutting the female plate with the legs of the projections being located in the slots of the associated keyholes and with the one terminal within the mating terminal; ramp means associated with and behind at least one of said keyhole slots for guiding at least one of said headed projections into and out of the depending portion on said keyhole slot; said ramp means including an inclined portion sloping from a front portion of said female plate towards a rear portion thereof connected to a vertical guide-plate portion extending downwardly and terminating behind and spaced from said one keyhole slot; and releasable locking means on one of said plates for engaging means on the other of said plates to lock said plates in connected position by preventing relative movement between said plates in the direction of said keyhole slots until said locking means is released.

4,550,969

WIRE CONNECTOR WITH CUTTING EDGE

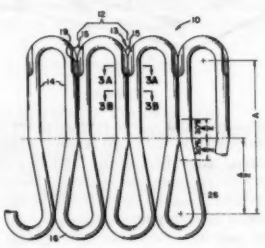
Karl-Heinz Pohl, Buffalo, Minn., assignor to The Siemon Company, Watertown, Conn.

Continuation-in-part of Ser. No. 271,603, Jun. 8, 1981, Pat. No. 4,440,466. This application Sep. 29, 1983, Ser. No. 537,071

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.⁴ H01R *9/08*

U.S. Cl. 339—98 **9 Claims**



1. A multiple terminal solderless electrical connector comprising:

a discrete number of interconnected loops, said loops being formed from a continuous piece of conductive resilient material, said loops being arranged in a co-planar relationship between two end loops, said loops each having two straight parallel side portions connected by a semi-circular portion, said straight side portions of adjacent said loops being in an abutting relationship, each of said straight side portions having incorporated therein a cutting edge, at least all of those loops intermediate the end loops having nonparallel extensions of said straight side portions, said extensions each having an arcuate section which connects with an arcuate section of an extension of an adjacent loop whereby said extensions interconnect the abutting side portions of adjacent loops through open loops between each pair of said extensions, the length of each of said extensions being greater than the radius of said connected arcuate sections.

4,550,970

ELECTRIC TERMINAL

Satoru Ogino, Kitamoto, Japan, assignor to Kobishi Electric Co., Ltd., Japan

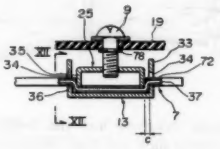
Filed Sep. 7, 1983, Ser. No. 529,950

Int. Cl.⁴ H01R *4/02*

U.S. Cl. 339—97 P **14 Claims**

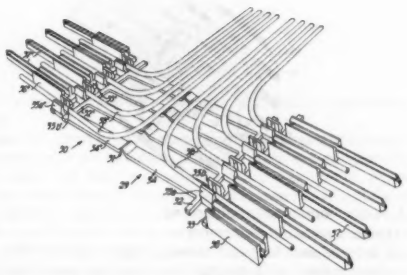
1. An electric terminal for electrically connecting a conductor, comprising:

(a) a non-conducting casing having a support surface;
(b) a stationary member made of an electrically conductive material and attached to the casing, the stationary member including a channel-shaped portion with a pair of flanges defining a recess therein which is open in the direction toward the support surface of the casing;
(c) an electrically conductive movable member having a portion adapted to be inserted into the recess of the stationary member; and
(d) an electrically conductive screw member threadedly engaging with the movable member and making electrical



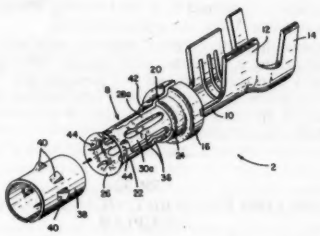
contact with the conductive movable member without contacting the stationary member, said screw member being rotatably supported by the casing support surface so that the movable member moves towards and away from the recess in said stationary member by the rotation of said screw member, whereby one end portion of a conductor located between the stationary member and the movable member in the region of the recess is clamped between the stationary member and the movable member by the flanges of the stationary member and at least part of the movable member received by the recess of the stationary member.

4,550,971
CONNECTOR
Alain Gentric, Lotissement Keranroux Ploubezre, F-22300 Lannion, France
Filed Dec. 16, 1982, Ser. No. 450,363
Claims priority, application France, Dec. 29, 1981, 81 24643
Int. Cl.⁴ H01R *4/02*
U.S. Cl. 339—99 R **2 Claims**



1. A coupling connector having self-stripping connection-making plugs for separately clamping insulated conductors, the connector comprising a housing with two half-shells joined by a hinge, at least one of the half-shells including a row of self-stripping plug supports, said one half-shell bearing the row of self-stripping plug supports also including a row of holes behind said self-stripping plug supports, at least the rear part of each of said self-stripping plug supports lying in a plane and having a U-shaped cross section, the other half-shell including a row of wire clamping U-shaped groove means, wherein each of the U-shaped groove means includes a pair of spears which are symmetrical with respect to the longitudinal axis of the groove means, the U-shaped groove means and the self-stripping plug supports having longitudinal axes which are parallel to each other, said U-shaped groove means having a face lying in a plane which is transverse to the U-shaped groove means, said plane of said U-shaped groove means being located behind the plane of the rear faces of the self-stripping plug supports and each wire clamping U-shaped groove means being aligned with a self-stripping plug support when the two hinged half-shells are closed one on the other, the spear pairs of the other half-shell hooking into individually associated ones of said holes when the two half-shells are closed one on the other.

4,550,972
CYLINDRICAL SOCKET CONTACT
Paul E. Romak, Langen, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 9, 1984, Ser. No. 598,127
Int. Cl.⁴ H01R *13/11*
U.S. Cl. 339—256 R **3 Claims**



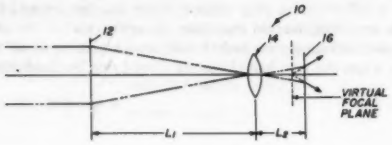
1. A cylindrical stamped and formed contact socket which is intended to receive a contact pin, the socket having an open pin-receiving end and an inner end, the inside diameter of the socket being substantially equal to, and greater than, the diameter of the pin, the socket being characterized in that:
the socket has a first circumferentially continuous ring at the pin-receiving end, a second circumferentially continuous ring at the inner end, and an axially extending seam which extends from the pin-receiving end to the inner end,
an intermediate portion of the socket which is between the first and second rings comprises an even number plurality of at least four substantially identical beams which have ends that are integral with the first and second rings, the beams being at equally spaced angular intervals around the axis of the socket so that a plurality of pairs of diametrically opposed beams are provided,
each of the beams having a contact boss which projects inwardly towards the axis of the socket, the bosses on each pair of opposed beams being aligned with respect to the axis of the socket, the minimum distance between the surfaces of the bosses being substantially equal to, and less than, the diameter of the contact pin,
the associated pairs of beams having their bosses spaced from the first ring at increasing distances,
the pin-receiving end being outwardly flared and a cylindrical supporting sleeve is mounted on the socket in surrounding relationship thereto, the supporting sleeve being between the pin-receiving end and the inner end whereby, during insertion of the pin into the socket, the bosses on the associated pairs of beams are sequentially encountered by the pin and the beams are sequentially deflected, and after the pin is fully inserted it will be in contact with the socket at a plurality of equally spaced intervals along its axis and around its circumference.

4,550,973

ACHROMATIC HOLOGRAPHIC OPTICAL SYSTEM

Robert E. Hufnagel, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 14, 1983, Ser. No. 475,285
Int. Cl.[4] G02B 5/32
U.S. Cl. 350—3.72 **20 Claims**



1. An optical imaging system achromatic over a wide band comprising:
- a first diffractive optical element, said first element comprising a hologram, said first element comprising the system primary element, said first element having a comparatively large aperture and a focal length $1/\phi_1$;
- an optical axis defined by a line bisecting and perpendicular to said first diffractive optical element;
- a second diffractive optical element, said second element comprising a hologram, said second element being spacially displaced from said first element; and
- a third optical element positioned intermediate said first and second elements in the direction of travel of light, said third element being achromatic.

4,550,974

LOW LOSS FUSED BICONICAL TAPER OPTIC COUPLER

Kent A. Murphy, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 529,819, Sep. 6, 1983, abandoned, which is a division of Ser. No. 484,343, Apr. 12, 1983, Pat. No. 4,426,215, which is a continuation of Ser. No. 309,360, Oct. 7, 1981, abandoned. This application Apr. 4, 1985, Ser. No. 719,634
Int. Cl.[4] G02B 5/172
U.S. Cl. 350—96.15 **4 Claims**

1. A low loss fused biconical taper fiber optic coupler comprising:
- a plurality of optical fibers each having a core and a cladding surrounding the core, said fibers being fused together in a unitary biconical tapered region including a first tapered region, a second tapered region and a deformed region therebetween, the cores in said deformed region being scrambled.

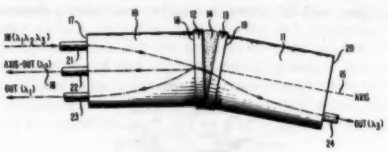
4,550,975

OPTICAL COUPLING DEVICES

Frank H. Levinson, Bethlehem, and Rudolph C. Schweizer, South Whitehall Township, Lehigh County, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 29, 1982, Ser. No. 373,135
Int. Cl.[4] G02B 5/14
U.S. Cl. 350—96.18 **15 Claims**

1. An optical device for diverting light from one transmission element to another comprising:
- first and second light focusing elements each having two surfaces, with one surface of each element positioned in a spaced relationship;
- first and second partially reflecting elements positioned in the space between the focusing elements and having their optical axes at an angle other than 180° to each other; and
- a plurality of light transmission elements coupled to a surface of the first light focusing element opposite to said reflecting elements and at least one transmission element coupled to a surface of the second light focusing element opposite to said reflecting elements, the position of the transmission elements, and the angle of the reflecting elements being such that light incident on each reflecting element is coupled between different transmission elements while at least a portion of the light is transmitted from a transmission element on the surface of the first focusing element to a transmission element on the opposite surface of the second focusing element.

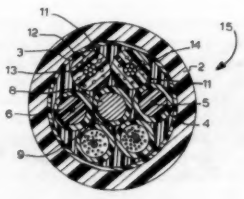


4,550,976

FIBER OPTIC CABLE WITH FOAMED PLASTIC DUMMY MEMBERS

Stephen M. Cooper, Hickory, and Saeed K. Sooudi, Charlotte, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Sep. 10, 1984, Ser. No. 648,668
Int. Cl.[4] G02B 5/16
U.S. Cl. 350—96.23 **6 Claims**



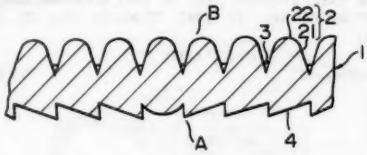
1. A fiber optic cable comprising:
- (a) an elongated core member;
- (b) at least one elongated tubular member and at least one optical fiber, said optical fiber disposed in the tubular member and said tubular member disposed on the periphery of said core member;
- (c) at least one "dummy" elongated member disposed coextensive with said elongated tubular member on the periphery of said core member, said "dummy" elongated member including a central elongated member having a diameter less than the diameter of said elongated tubular member and a jacket, circumscribing said central elongated member, composed of foamed plastic material containing a multiplicity of void spaces therein;
- (d) a jacket member circumscribing said "dummy" elongated and tubular members.

4,550,977

REAR PROJECTION SCREEN

Masao Inoue, and Shingo Suzuki, both of Tokyo, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,966
Claims priority, application Japan, Jun. 13, 1983, 58-105341
Int. Cl.[4] G03B *21/60*
U.S. Cl. 350—128 4 Claims



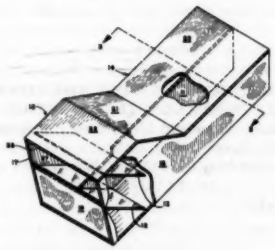
1. A rear projection screen having a viewer's side and a projection side, said rear projection screen comprising: a lenticular lens formed on said viewer's side and including a multiplicity of vertically extending lens units each being provided at its both sides with total reflection surfaces, said lenticular lens further including in the troughs between adjacent lens units a multiplicity of refraction elements which diffuse the light in the vertical direction.

4,550,978

THREE-DIMENSIONAL VIEWING DEVICE

Alvin A. Friedle, 5579 S. 2700 West, Roy, Utah 84067

Filed May 7, 1984, Ser. No. 607,804
Int. Cl.[4] G02B *7/18, 27/22*
U.S. Cl. 350—138 4 Claims



1. A viewing device for creating a stereoscopic effect comprising:

(a) an elongated housing of generally rectangular cross-sectional contour having a partially open eye-directed extremity and fully open subject-directed extremity, upper and lower surfaces and opposed side panels, and a plane of symmetry that extends in the direction of elongation and perpendicularly bisects said upper and lower surfaces,

(b) a divider panel positioned within said housing and perpendicularly disposed between upper and lower surfaces within said plane of symmetry in a manner to form two separate and identical viewing channels of rectangular cross-sectional configuration,

(c) first flat reflector means mounted at that extremity of each of said viewing channels which is closest to the eye-directed extremity of the housing, said reflector means being perpendicularly disposed between said panels and forming an upwardly opening angle of about 135° with respect to the center axis of elongation of each viewing channel, and

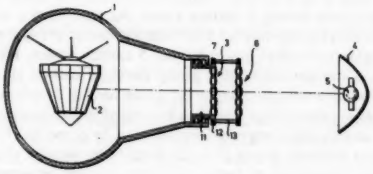
(d) second flat reflector means mounted directly above said first reflector means and parallel thereto, and adapted to receive light from said first reflector means and re-direct said light out of the eye-directed extremity of said housing on a path parallel to the axes of said channels.

4,550,979

TESTING APPARATUS INCLUDING A VACUUM-TIGHT RADIATION WINDOW

Hans-Jürgen Meier, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 620,187
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325581
Int. Cl.[4] G02B *7/00, 27/00*
U.S. Cl. 350—321 6 Claims



1. In a testing apparatus equipped with a container wherein a device such as a satellite can be tested under outer-space conditions by subjecting the apparatus to radiation from a radiation source, the container having an opening for admitting the radiation into the interior thereof and the radiation source including a collector comprising: a vacuum-tight radiation window mounted on said container to conduct the radiation through said opening, said radiation window including frame means mounted on said container; and, a plurality of lens elements mounted in said frame means so as to be disposed one next to the other.

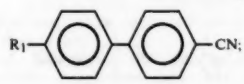
4,550,980

LIQUID CRYSTAL COMPOSITION AND DISPLAY ELEMENT INCLUDING SAME

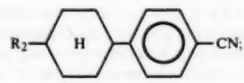
Hiroshi Shingu, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,285
Claims priority, application Japan, Dec. 4, 1981, 56-195152
Int. Cl.[4] G02F *1/13;* C09K *3/34*
U.S. Cl. 350—349 17 Claims

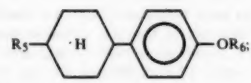
1. A liquid crystal composition for a guest-host type liquid crystal display, comprising at least one of each of compounds (1), (2) and (5) represented by the following general formulas:



(1)

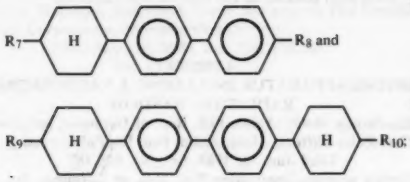


(2)



(5)

including at least one of each compound of the formulas (6) and (7) represented as follows:



and a mixture of an anthraquinone dye and an azo dye wherein R_1 represents a straight-chain alkyl group having from 2 to 8 carbon atoms, R_2 represents a straight-chain alkyl group having from 2 to 7 carbon atoms, R_5 represents a straight-chain alkyl group having 3 carbon atoms, R_6 represents a straight-chain alkyl group having 2 or 4 carbon atoms, R_7 represents a straight-chain alkyl group having 5 carbon atoms, R_8 represents a straight-chain alkyl group having 2 carbon atoms, R_9 represents a straight-chain alkyl group having 5 carbon atoms and R_{10} represents a straight-chain alkyl group having 3 carbon atoms, the compound represented by formula (1) being present between about 10 to 29 percent by weight, the compound represented by formula (2) being present between about 10 to 50 percent by weight, the compound represented by formula (5) being present between about 10 to 30 percent by weight, the compound represented by formula (6) being present between about 10 to 30 percent by weight and the compound represented by formula (7) being present between about 5 to 20 percent by weight, the compounds represented by formulas (1) and (2) being present collectively between about 20 to 70 percent by weight and the compounds represented by the formulas (6) and (7) being present collectively between about 10 to 40 percent by weight, said composition having a positive dielectric anisotropy.

4,550,981

LIQUID CRYSTALLINE ESTERS AND MIXTURES

Martin Petrzilka, Kaiseraugst; Martin Schadt, Seltisberg, and Alois Villiger, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

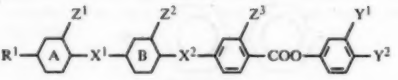
Filed Sep. 9, 1983, Ser. No. 530,830

Claims priority, application Switzerland, Sep. 30, 1982, 5757/82; Nov. 10, 1982, 6546/82; Jun. 27, 1983, 3499/83

Int. Cl.⁴ G02F *1/13;* **C09K** *3/34;* **C07C** *121/52, 54/70, 69/90, 79/26*

U.S. Cl. 350—350 R **25 Claims**

1. A compound of the formula:



wherein X^2 is —COO—; X^1 is p—C_6H_4—, p—C_6H_4—CH_2CH_2—, —CH_2CH_2—p—C_6H_4—, p—C_6H_4—COO— or —COO—p—C_6H_4—; ring A is a benzene ring or trans-1,4-cyclohexylene; ring B is a benzene ring; Z^1 and Z^2 individually are hydrogen or when positioned on a benzene ring which is not linked directly with a further ring via a single covalent bond, Z^1 and Z^2 also can be halogen, cyano or methyl; Z^3 is hydrogen, halogen, cyano or methyl; Y^2 is cyano, nitro, 2,2-dicyanovinyl or when Y^1 is hydrogen Y^2 also can be 2,2-dicyano-1-methylvinyl; Y^1 is halogen, cyano, C_1–C_3-alkyl or hydrogen; and R^1 is C_1–C_{12}-alkyl or when positioned on a benzene ring R^1 also can be C_1–C_{12}-alkoxy.

4,550,982

ALL-SOLID-STATE DISPLAY INCLUDING AN ORGANIC ELECTROCHROMIC LAYER WITH ION DONOR/ACCEPTOR

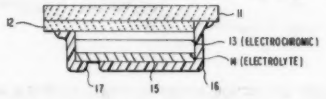
Yoshihiko Hirai, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1982, Ser. No. 440,465

Claims priority, application Japan, Nov. 9, 1981, 56-179311; Mar. 24, 1982, 57-46907; May 24, 1982, 57-87488; May 27, 1982, 57-90109; May 27, 1982, 57-90110; May 27, 1982, 57-90111

Int. Cl.⁴ G02F *1/17*

U.S. Cl. 350—357 **76 Claims**



1. An all-solid-state electrochromic display device comprising a substantially transparent electrode, a counter electrode, and an electrochromic layer between said transparent and said counter electrodes, wherein said electrochromic layer consists essentially of a polymer electrochromic film comprising at least one organic electrochromic material and at least one ionic material.

4,550,983

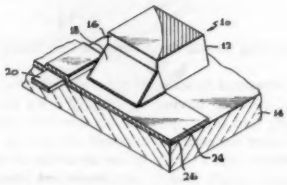
MAGNETO-OPTIC DEVICE FOR THE CONTROL OF ELECTROMAGNETIC RADIATION

William E. Ross, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 9, 1983, Ser. No. 492,584

Int. Cl.⁴ G02F *1/09*

U.S. Cl. 350—376 **12 Claims**



1. A magnetic domain device comprising:

(a) a non-magnetic substrate transparent to electromagnetic radiation,

(b) a magnetic layer on said substrate,

(c) a mesa formed in said magnetic layer,

(d) a sloping sidewall extending outwardly from said mesa adjoining said substrate,

(e) a first electrical conductor positioned along a sidewall of said mesa adjoining said sloping sidewall,

(f) an electrical insulator on said first electrical conductor and at least said sloping sidewall, and

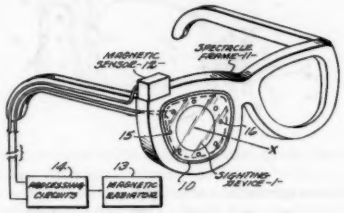
(g) a second electrical conductor positioned along said mesa at least on said sloping sidewall.

4,550,984

HEAD-MOUNTED OR HELMET-MOUNTED SIGHTING DEVICE

Jean C. Reymond, Paris, France, assignor to Thomson CSF, Paris, France

Filed Feb. 22, 1983, Ser. No. 468,599
Claims priority, application France, Feb. 26, 1982, 82 03261
Int. Cl.[4] G02F 1/21; G01C 9/06; F21Q 3/00
U.S. Cl. 350—404 7 Claims



1. A sighting device comprising:

means for simultaneous visual display of the landscape and of an image which is projected to infinity on an optical line of sight, said visual display means utilizing an assembly of crystal plates in which a birefringent plate having parallel faces is placed between two plates having the function of optical polarizing filters consisting respectively of a polarizer and an analyzer to produce said image in the form of interference fringes localized at infinity and which are generated from the incident light emitted by the landscape under observation, said optical line of sight corresponding to the crystal axis of the birefringent plate which is cut at right angles to this direction;

means for indicating the direction of said line of sight with respect to a reference direction; and

means for visual display of preliminary information relating to orientation of the sighting direction including a set of electroluminescent diodes placed outside the field of view of the interference fringes, and auxiliary computing means for automatically initiating turn-on and winking operation of the diodes at a frequency which is variable as a function of the relative angular displacement of the optical line of sight with respect to a given sighting direction, and auxiliary detection means for determining said given sighting direction and for transmitting the corresponding information to said computing means.

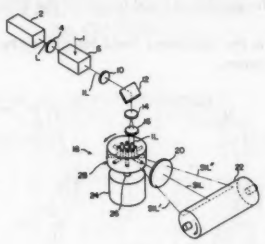
4,550,985

LIGHT DEFLECTOR

Kiyoshi Hayashi, Takatsuki, Japan, assignor to Mita Industrial Co., Ltd., Japan

Filed Jun. 2, 1982, Ser. No. 384,316
Claims priority, application Japan, Jun. 17, 1981, 56-92353
Int. Cl.[4] G02B 27/17; G03C 1/10
U.S. Cl. 350—6.3 5 Claims

1. A light deflector comprising a two-stage cylindrical rotating member having a small diameter portion and a large diameter portion and including at least one light transmitting member, each light transmitting member having an input terminal located on the peripheral side surface of said small diameter portion and a corresponding output terminal located on the peripheral side surface of said large diameter portion such that when said rotating member rotates, a light beam, entering an input terminal exits from the corresponding output terminal,



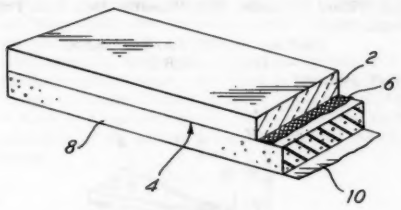
and is rotatingly scanned about the rotating axis of the rotating member.

4,550,986

LAYERED MIRRORS INCLUDING A COMPRESSIBLE LAYER AND A POLYURETHANE SKIN

Roger J. Leach, 12 Tufton Gardens, Hurst Park, East Molesey, Surrey, England

Filed Jul. 12, 1983, Ser. No. 513,076
Claims priority, application United Kingdom, Jul. 14, 1982, 8220430; European Pat. Off., Dec. 8, 1982, 82306542.0
Int. Cl.[4] G02B 5/08; B32B 9/00
U.S. Cl. 350—641 7 Claims



1. In a mirror structure comprising a transparent facing lamina backed by a layer of reflecting material and wherein said layer of reflecting material is bonded to a flexible and resiliently compressible layer of polymeric foam, the improvement wherein a flexible and substantially impermeable polyurethane skin is heat bonded to the face of the foam layer opposite that to which said layer of reflecting material is bonded.

4,550,987

SMALL SIZE TELEPHOTO LENS

Satoru Tachihara, Tokyo, Japan, assignor to Asahi Optical Co., Ltd., Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,379
Claims priority, application Japan, May 13, 1982, 57-80799
Int. Cl.[4] G02B 13/02
U.S. Cl. 350—454 6 Claims

1. A six-element telephoto lens sytem comprising, in order from an object, a first positive lens, a second negative lens, third and fourth positive-meniscus lenses having convex surfaces directed toward the object, a fifth negative lens, and a sixth positive lens, said lens system being arranged to meet the following conditions

(1) $0.4f < f_{1,2,3} < 0.75f$
(2) $0.35f < f_{1,2,3,4} < 0.6f$
(3) $0.65f < f_1 < 0.8f$
(4) $d_2 < 0.02f$
(5) $0.2f < |f_{5,6}| < 0.45f$, $f_{5,6} < 0$

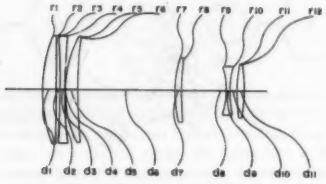
(6) $0.05 < n_5 - n_6$

where

f is the focal length of the overall lens system,

$f_{1, 2, 3}$ is the combined focal length of the first through third lenses,

$f_{1, 2, 3, 4}$ is the combined focal length of the first through fourth lenses,



f_1 is the focal length of the first lens,

d_2 is the distance between the first and second lenses,

$f_{5, 6}$ is the combined focal length of the fifth and sixth lenses,

n_5 is the refractive index of the fifth lens, and

n_6 is the refractive index of the sixth lens.

4,550,988

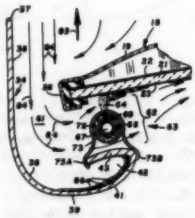
SIDE REAR VIEW MIRROR CLEANING SYSTEM

Benjamin P. Harder, 141 Shadywood La., Delano, Minn. 55328, and Willard J. Harder, 8556 Hiawatha Ave., Eden Prairie, Minn. 55344

Filed Sep. 1, 1983, Ser. No. 528,620

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—584 **35 Claims**



1. An apparatus for clearing foreign material from the viewing mirror surface of a rear view mirror adapted to be mounted on the side of a vehicle, said mirror having opposite side edges, comprising:

air deflector means for directing air across the mirror surface, means for mounting the air deflector means adjacent one side edge of the mirror, said air deflector means having a generally upright first section extended generally in the direction of forward movement of the vehicle, a curved second section joined to the first section to direct air around said one side edge of the mirror, and a third section joined to the second section to direct air toward the mirror surface, said third section having a curved end portion, said end portion having an inwardly turned lip providing a generally upright pocket for collecting particles separated from the air moving to the mirror surface, said air moving across the mirror surface, and means located adjacent said third section operable to discharge fluid onto the mirror surface, said fluid and air moving across the mirror surface to clear the mirror surface of foriegn material and fluid thereon.

4,550,989

RIMLESS SPECTACLES

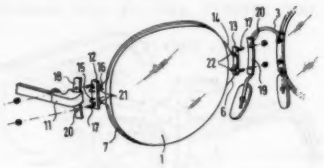
Klaus Hafner, Knappenweg 7, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1982, Ser. No. 446,672

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148166; Oct. 27, 1982, 3239700

Int. Cl.[4] G02C *1/08, 1/04, 5/00*

U.S. Cl. 351—103 **4 Claims**



1. Rimless spectacles comprising:

a pair of lenses each having a rim and opposite faces;

a bridge piece connected between said lenses, said bridge piece having at least one fixed projection on either side thereof, each fixed projection extending over a portion of one face of each lens adjacent the rim of each lens, said bridge piece having at least one bendable clamping projection spaced from at least one fixed projection and bent into clamping engagement with another face of each lens adjacent the rim of each lens so that said bridge piece is clamped to each lens;

an end-piece connection to each lens on a side of each lens substantially opposite said bridge piece, each end piece having at least one fixed projection for engagement over one face of one of said lenses and at least one bendable clamping projection engaged with an opposite face of each lens and bent into clamping engagement with each lens for clampingly connecting each end-piece to each lens respectively;

a thread engaged completely around the rim of each lens and fixed to said bridge piece and one end-piece for holding said lenses to said bridge piece and end-pieces;

each end-piece including four holes, end portions of each thread extending into said holes of a respective end-piece to form a pair of loops, said bridge piece including at least two holes on each side thereof adjacent each lens respectively for receiving each thread respectively to form at least one loop, said loops being increaseable in size to tighten the connection between said end-pieces, said bridge piece and said lenses, and reducible in size to loosen the connection for permittng repositioning of said bridge piece and end-pieces.

4,550,990

ARRANGEMENT FOR THE CARRYING OUT OF EYE EXAMINATION

Stephan Trispel, and Günter Rau, both of Aachen, Fed. Rep. of Germany, assignors to Forschungsgesellschaft für Biomedizinische Technik e.V., Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,255

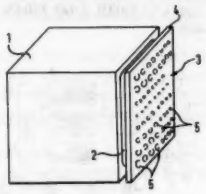
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133608

Int. Cl.[4] A61B *3/02*

U.S. Cl. 351—243 **9 Claims**

1. An arrangement for the carrying out of eye examinations by means of a transparent optotype mask carrying a variety of optotypes illuminated from the rear, characterized by the fact that the optotype mask is arranged in front of a display device whose brightness, color, contrast and partial or complete surface illumination can be controlled for the carrying out of different eye tests, and on which additional static or moving structures can be generated and shown in the field of view of the optotype mask for the carrying out of the eye tests; and that

a display control device for the controlling of the brightness, color, contrast or the partial or complete surface illumination and the generation of additional static or moving structures is connected to the display device; and a programmable control device, particularly one or more microprocessors for the pro-



grammable operation of the display control device and of the exchange and/or position control device, by which, for the partial or complete automating of the eye test, both the changing and/or positioning of the optotype masks and the control of the display surface and/or of the display presentation can be programmed.

4,550,991

DEVICE FOR DETECTING CODE ON FILM CARTRIDGE

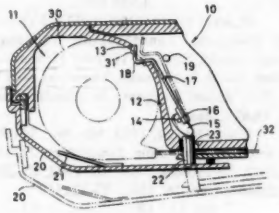
Sunao Ishizaka, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,310

Claims priority, application Japan, Dec. 2, 1983, 58-186808[U]

Int. Cl.⁴ G03B *7/24*

U.S. Cl. 354—21 **2 Claims**



1. In a camera of the type capable of using a film cartridge having a code indicia including a plurality of electrically conductive contacts representative of one or more features of a film encased in said film cartridge, a code indicia detecting device comprising:

(a) wall members which define a film chamber for receiving therein said film cartridge and which are formed with openings which are in opposed relationship with said code indicia on said film cartridge;

(b) detection means which has electrical contact means which in turn can be moved between first positions at which said electrical contact means are extended into said film chamber through said openings of said wall members and second positions at which said electrical contact means are retracted away from said film chamber, said detection means being capable of deriving an electrical signal from said code indicia through said electrical contact means;

(c) a back member which opens or closes said film chamber; and

(d) means for operatively connecting said detection means to said back member in such a way that when said back member closes said film chamber, said electrical contact means are forced into their first positions.

4,550,992

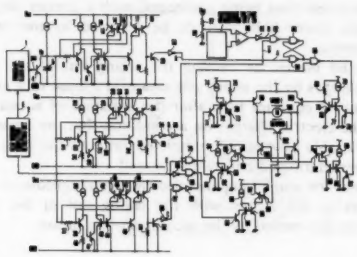
MOTOR DRIVE CONTROL CIRCUIT

Masanori Ohtsuka, Kanagawa, and Ryuji Tokuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,668

Int. Cl.⁴ G03B *1/18*

U.S. Cl. 354—173.11 **7 Claims**



1. A motor drive control circuit for a camera, comprising:

a motor for feeding a film;

a timer for time counting for a predetermined period of time from a certain point of time after commencement of a driving operation of the motor;

comparison means for comparing a power supply voltage with a reference voltage during the time counting process of said timer, said comparison means being arranged to generate an operation signal when said power supply voltage is above said reference voltage and to generate an inhibiting signal when the power supply voltage is below the reference voltage; and

holding means for holding the output signal produced from said comparison means, said holding means being arranged to permit a further operation of the camera when it holds said operation signal and to inhibit the further operation of the camera when it holds said inhibiting signal.

4,550,993

DEVICE FOR PROVIDING A CAMERA SYSTEM WITH AN INFORMATION FOR A FOCUS ADJUSTMENT

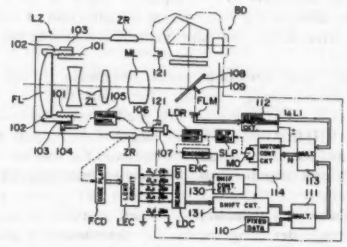
Nobuyuki Taniguchi, Tondabayashi; Norio Ishikawa, Osaka; Yasuaki Akada, Sakai; Takeshi Egawa, Sennan, and Kunio Kawamura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1984, Ser. No. 575,681

Claims priority, application Japan, Feb. 1, 1983, 58-15860; Jul. 6, 1983, 58-123993

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—402 **8 Claims**



8. A device for processing light information comprising:

means for receiving light including a plurality of photosensitive elements each capable of accumulating electric

charges generated in response to light falling on each of the photosensitive elements, respectively;

means for taking out the electric charges accumulated in each of the photosensitive elements to serially produce electric signals corresponding thereto;

first means for causing the taking out of the electric charges by the taking out means at a lapse of a variable time after an initiation of accumulating the electric charges, the variable time being prolonged with a greater degree for the lower light level to be received by the receiving means;

second means for causing the taking out of the electric charges by the taking out means at a lapse of a predetermined constant time after the initiation of accumulating the electric charges on a condition that the lapse of the variable time is not completed prior to the lapse of the predetermined constant time; and

means for amplifying the electric signals produced by the taking out means with the taking out of the electric charges caused by the second causing means.

4,550,994

FOCUSING CONTROL DEVICE

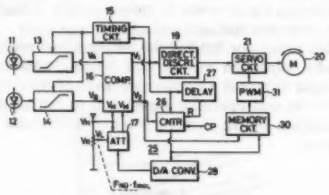
Takashi Maruyama, Suwa, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan

Filed Jul. 10, 1981, Ser. No. 282,142

Claims priority, application Japan, Aug. 6, 1980, 55-107899

Int. Cl.⁴ G03B *3/10*

U.S. Cl. 354—402 **4 Claims**



1. In a lens focusing device of the type having first and second range finding elements for generating first and second signals, first and second integrator circuits respectively receiving said first and second signals and providing outputs relative to one another according to the state of focus, the output of said first integrator circuit being larger than the output of said second integrator circuit in the case of a front focusing condition and the output of said second integrator circuit being larger than the output of said first integrator circuit in the case of a rear focusing condition, and a direction discriminating means, responsive to the outputs of said first and second integrator circuits, for determining the direction of rotation of a lens drive motor, the improvement comprising the combination of

shift range detecting means, responsive to said direction discriminating means, for detecting a difference (VH−Vx) between a first predetermined threshold value (VH) first reached by the larger of the outputs of said first and second integrator circuits and the smaller value (Vx) of the outputs of said first and second integrator circuits; and

pulse width determining means, responsive to said shift range detecting means, for determining a pulse width utilized for energizing said lens drive motor in the ratio of said difference (VH−Vx) to a difference (VH−VL) between said threshold value (VH) and a second threshold value (VL).

4,550,995

AUTOMATIC FOCUS ADJUSTING DEVICE

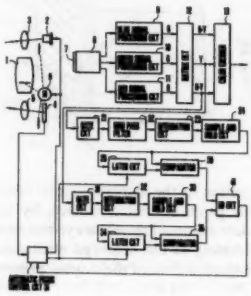
Masamichi Toyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,336

Claims priority, application Japan, Dec. 2, 1983, 58-228682

Int. Cl.⁴ G03B *3/00*; H04N *5/38*

U.S. Cl. 354—403 **4 Claims**



1. An automatic focus adjusting device comprising:

(a) first detecting means for detecting that an image of an object has gone out of focus;

(b) second detecting means for detecting that an image of an object has moved; and

(c) signal producing means receptive of signals from said first and said second detecting means for producing a signal contributing to a focusing action.

4,550,996

FLASH PHOTOGRAPHY SYSTEM

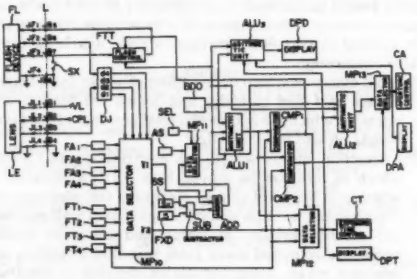
Nobuyuki Taniguchi, Tondabayashi; Masaaki Nakai, Nara; Takanobu Omaki, Sennan; Hiroshi Hosomizu, Nara; Masatake Niwa, Sakai; Toru Inoue, Toyonaka, and Minoru Sekida, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1983, Ser. No. 544,871

Claims priority, application Japan, Oct. 22, 1982, 57-186640; Oct. 29, 1982, 57-190996; Nov. 16, 1982, 57-201382; Nov. 29, 1982, 57-209844; Dec. 16, 1982, 57-221510

Int. Cl.⁴ G03B *7/00, 15/03*

U.S. Cl. 354—416 **27 Claims**



1. A flash photography system, comprising:

(a) first light measuring means for measuring ambient light;

(b) film sensitivity output means for producing a signal representing the sensitivity of the photographic film used in the camera;

(c) exposure time output means for producing exposure time data for flash light photography;

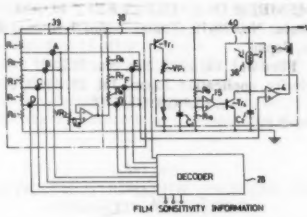
(d) first aperture value output means for calculating a desired first diaphragm aperture value for flash light photograpny based on the data obtained by said first iight measuring means, said film sensitivity output means and said exposure time output means;
(e) second aperture value output means for producing a second aperture value independent of the light value of the ambient light;
(f) data selecting means for outputting said first diaphragm aperture value or said second aperture value;
(g) shutter control means for controlling the camera shutter based on the exposure data of said exposure time output means;
(h) aperture control means for controlling the actual diaphragm aperture size based on the output of said data selecting means;
(i) means for effecting flash light emission;
(j) second light measuring means for measuring the flash light emitted to, and reflected from, a photographic object;
(k) means for integrating the output of said second light measuring means; and
(l) means for producing a signal to stop the emission of the flash light when the output of said integrating means reaches a predetermined value.

4,550,997

AUTOMATIC EXPOSURE CONTROL CIRCUIT

Kohichi Nishi, Yokohama, and Akira Takahashi, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 16, 1984, Ser. No. 672,344
Claims priority, application Japan, Nov. 18, 1983, 58-217575
Int. Cl.⁴ G03B *7/083*
U.S. Cl. 354—459 **1 Claim**



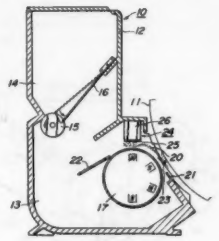
1. An automatic exposure control circuit of a photographing camera including an electromagnet for closing a shutter blade thereof when energized, a time constant circuit having a light receiving element and a capacitor for charging said capacitor upon an opening operation of said shutter and a driving circuit having inputs supplied with a charge voltage of said capacitor and a predetermined reference voltage for actuating said electromagnet to close said shutter blade when said charge voltage becomes equal to said reference voltage, comprising a film sensitivity information detector for electrically detecting the film sensitivity information to provide an output signal corresponding to the film sensitivity information detected, a film sensitivity switching means responsive to said output signal from said film sensitivity information detector for changing said reference voltage to be applied to said driving circuit and a γ value correcting means responsive to a γ value of said light receiving element for correcting a voltage to be applied to said film sensitivity switching means and hence said reference voltage to be applied to said driving circuit.

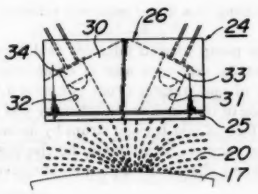
4,550,998

TONER CONCENTRATION DETECTING DEVICE

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,084
Claims priority, application Japan, Apr. 16, 1981, 56-57633
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **18 Claims**





1. A device for detecting toner concentration of a dry-type, two-component, magnetic developer consisting of magnetic carrier powders and toner powders contained in a housing of a developing apparatus having magnetic roll means including a plurality of magnetic poles of successively different polarities to form a plurality of independent ear-ups of the developer which correspond to the magnetic poles and are brought in contact with a member to be developed, said device comprising:
transparent plate-like means arranged to be brought in contact with the ear-ups of the developer which are held and carried by said magnetic roll means and have a lower developer concentration as compared with other portions of the developer than the ear-ups, wherein the surface of the transparent plate-like means is cleaned by the contact thereof with the ear-ups of the developer;
means for projecting light toward the ear-ups of the developer through the transparent plate-like means;
means for receiving light reflected by the ear-ups of the developer through the transparent plate-like means to produce a photoelectrically converted signal representing the toner concentration of the developer; and
means for optically separating from each other an optical path from the light projecting means to the transparent plate-like means and an optical path from the transparent plate-like means to the light receiving means.

4,550,999

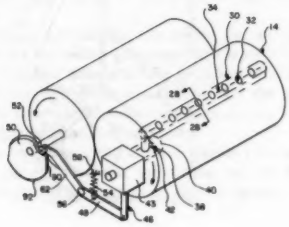
ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING TRANSFER HOLD-DOWN PUMP

Carl P. Anderson, Menlo Park, Calif., assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,026
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 TR **14 Claims**

1. In an electrophotographic copying apparatus in which

electrically charged toner of one polarity is transferred from an oppositely electrically charged surface of a photoconductive drum to the front side of a blank sheet for transforming said front side of the blank sheet into an intended copy as the back side of the blank sheet engages the surface of a transfer drum positioned adjacent said photoconductive drum, the transfer of toner occurring within a transfer nip defned by said photoconductive drum and said transfer drum, the improvement comprising



a cam rotating in a timed sequence relative to said transfer drum,

a vacuum pump located adjacent said transfer drum and actuated by said cam and in communication with the surface of said transfer drum to create a vacuum at said back side of the blank sheet, whereby said paper is held to the surface of said transfer drum by ambient air pressure and said vacuum, overcoming the electrostatic attraction of the blank sheet to said photoconductive drum.

4,551,000

PROCESS KIT AND AN IMAGE FORMING APPARATUS USING THE SAME

Shinji Kanemitsu, Ichikawa; Shigeyoshi Onoda, Kawasaki; Fumio Nishino, Tokyo; Akihiro Nomura; Morikazu Mizutani, both of Kawasaki, and Hiroshi Nitanda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,686

Claims priority, application Japan, Apr. 1, 1981, 56-48915

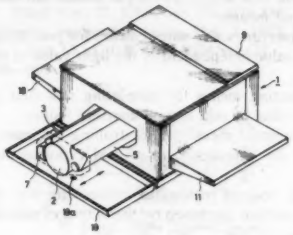
Int. Cl.[4] G03G *15/00*

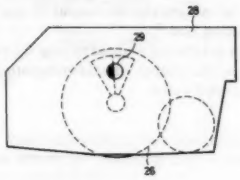
U.S. Cl. 355—3 R **21 Claims**

2. An image forming apparatus, comprising:

a process kit including process means provided in said process kit, said process means comprising an image bearing member and means actable thereon for repetitive image formation, and supporting means for supporting said process means as a unit, and means for memorizing an amount of use of said process kit;

a main assembly for cooperating with said process kit to form an image, said main assembly including means for forming a space for receiving said process kit and a guide for mounting said process kit into said main assembly and demounting said process kit from said main assembly; and





means for providing information relating to the amount of use of said process kit in accordance with the content of said memory means.

4,551,001

RECORDING APPARATUS USING A RECORDING MEMBER IN ENDLESS BELT FORM

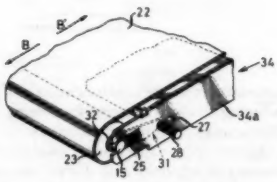
Takashi Yokota, No. 29-19, Tamazutsumi 1-chome, Setagaya-ku, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,357

Claims priority, application Japan, Jul. 20, 1982, 57-125133

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 BE **2 Claims**



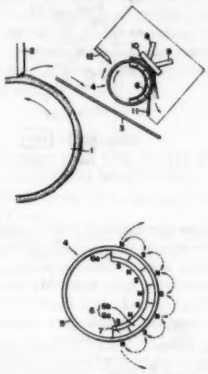
1. In a recording apparatus including a housing, a recording member unit in the form of an endless photoconductive belt, a plurality of rollers supported releasably in said housing and on which said belt is entrained and guided, biasing means for biasing at least one roller away from the others to tension said belt, tension releasing means in the form of a manually actuable grip for releasing the biasing means,

the improvement wherein said housing includes a stopper portion which engages said manual grip when it is attempted to insert said recording member unit in said housing in a condition where the biasing means is released, whereby the recording member unit is prevented from being inserted into said housing in said condition.

4,551,002
DEVELOPER DENSITY DETECTING APPARATUS

Matsuyuki Aoki, and Shuji Tanaka, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,354
Claims priority, application Japan, Oct. 4, 1983, 58-184382
Int. Cl.⁴ G03G *15/06*
U.S. Cl. 355—3 DD **3 Claims**



1. An apparatus for detecting developer density in a copying machine employing a developing roll, comprising:

a plate for receiving scraped off developer from said developing roll;

a detector roll assembly rotatably supported adjacent to said developing roll and above said plate, said detector roll assembly comprising a sleeve and a plurality of transversely extending magnets attached to the inner peripheral surface of said sleeve, said magnets being arranged to have different polarity alternately and terminating in the same polarity at both peripheral ends, magnets positioned at both peripheral ends having a greater magnetic flux density than that of other magnets;

a conductive glass for receiving toners from said detector roll assembly; and

means for photoelectrically detecting developer density from the toners adhered to said conductive glass.

4,551,003
ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS THEREFOR

Michio Ito, Kawasaki; Nobuo Kitajima, Toride; Masanao Kasai, Tokyo, and Shunichi Ishihara, Kodaira, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

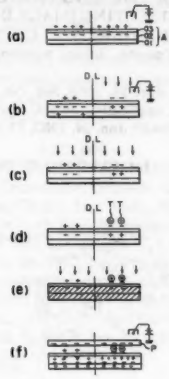
Continuation of Ser. No. 270,587, Jun. 4, 1981, abandoned, which is a division of Ser. No. 31,592, Apr. 19, 1979, Pat. No. 4,286,032. This application Aug. 5, 1983, Ser. No. 520,580
Claims priority, application Japan, Apr. 27, 1978, 53-50629; Jan. 31, 1979, 54-10178
Int. Cl.⁴ G03G *15/00, 15/02*
U.S. Cl. 355—3 R **15 Claims**

1. An electrophotographic apparatus including a movable photosensitive member for use in making repeated image formations, wherein the photosensitive member essentially comprises a conductive layer, an insulating surface layer, and a photoconductive layer of a particular polarity type material interposed between said conductive layer and said insulating surface layer, said apparatus comprising:

means for forming an electrostatic latent image on the photosensitive member;

means for applying a developer to the latent image bearing photosensitive member;

corona discharging means, disposed downstream of said developer applying means with respect to movement of said photosensitive member, for applying a corona discharge to said photosensitive member bearing said developed image, said discharge having a polarity which is the same as the polarity type of the photoconductive layer, to form an electric field across the photoconductive layer of said photosensitive member; and

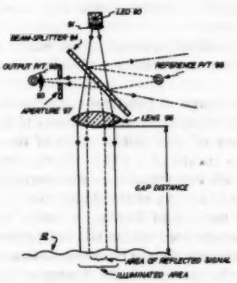


means, disposed downstream of said corona discharging means with respect to movement of said photosensitive member, for exposing the photosensitive member to light to eliminate said electric field across the photoconductive layer whereby the lowering of the image contrast is substantially prevented.

4,551,004
TONER CONCENTRATION SENSOR

Demetris E. Paraskevopoulos, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 198,993, Oct. 21, 1980, abandoned. This application Aug. 24, 1984, Ser. No. 644,147
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **9 Claims**



1. Apparatus for monitoring toner concentration including

a. a light emitting diode (LED)

b. a first phototransistor,

c. a photoreceptor surface,

d. a beam splitter in communication with the LED and the phototransistor,

e. a first lens disposed between the beam splitter and the photoreceptor surface for collimating the light from the LED, a portion of the light from the LED transmitted through the beam splitter and the lens to the photoreceptor surface, a portion of the collimated light reflected from

the photoreceptor surface being transmitted back through the first lens and reflected from the beam splitter to the phototransistor to compensate for variable distance between the first lens and the photoreceptor surface.

4,551,005

METHOD OF FORMING IMAGES OF SENSOR PATTERNS IN EFFECTING IMAGE DENSITY CONTROL OF ELECTROPHOTOGRAPHIC COPYING APPARATUS

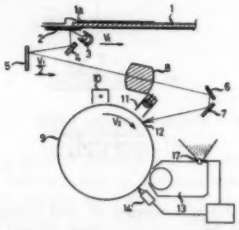
Yasushi Koichi, Yamato, Japan, assignor to Ricoh Company Ltd., Japan

Filed Apr. 14, 1983, Ser. No. 485,015

Claims priority, application Japan, Apr. 16, 1982, 57-62592; Apr. 20, 1982, 57-64639; Jun. 24, 1982, 57-107525; Jun. 28, 1982, 57-109820

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—8 **4 Claims**



1. A method of forming a visible image of a sensor pattern on a photosensitive member of an electrophotographic copying apparatus having a variable magnification or reduction rate suitable for use in conjunction with a method of controlling image density of copies produced by the copying apparatus, comprising the steps of:

placing the sensor pattern of a reference density substantially flush with a surface on which a document to be copies is placed;

exposing the surface of the photosensitive member that has been electrically charged by means of a charger to an optical image of said sensor pattern by exposing means to form a latent image of the sensor pattern in a region of the photosensitive member outside a document image forming region; and

developing said latent image of the sensor pattern by developing means to obtain a visible image of the sensor pattern;

said visible image of the sensor pattern being used in said method of controlling image density in such a manner that the density of said visible image of the sensor pattern is sensed by means of a photoelectric element which produces an electric signal used for controlling the density of an image of a copy of the document;

wherein said method of forming a visible image of a sensor pattern is characterized by further comprising the step of:

erasing an electric charge from the surface of the photosensitive member excepting the document image forming region and the region of the latent image of the sensor pattern in an erasing step in which the electric charge is removed by irradiation of the region with light beams performed between the step of electrically charging the surface of the photosensitive member and the step of developing the latent image of the sensor pattern, to thereby restrict the region of said latent image of the sensor pattern to a region located within a region of the surface of the photosensitive member on which an image of the sensor pattern would be formed when copying is performed at a minimum rate of reduction of the electrophotographic copying apparatus.

4,551,006

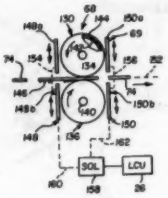
THERMAL CONSERVATION APPARATUS

Warren G. Elvin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,652

Int. Cl.[4] G03G *15/20*

U.S. Cl. 355—14 FU **10 Claims**



1. In reproduction apparatus in which copy sheets carrying unfused images are moved successively along a path through a heated fuser, thermal conservation apparatus comprising:

a selectively moveable gate assembly located adjacent to said heated fuser in said copy sheet path; and

control means, coupled to said gate assembly, for opening said assembly to pass a copy sheet and for closing said gate assembly when a copy sheet is not passing to minimize the loss of thermal energy from said fuser along said copy sheet path.

4,551,007

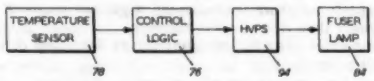
CONTROLLER FOR A FUSING DEVICE OF AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

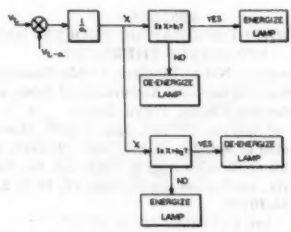
Michael R. Elter, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1984, Ser. No. 609,179

Int. Cl.[3] G03G *15/20*

U.S. Cl. 355—14 FU **14 Claims**





8. An electrophotographic printing machine of the type having a fusing apparatus for fusing toner powder images transferred to copy sheets during a copy run of the printing machine, wherein the improved fusing apparatus includes:

means for applying heat to at least the toner powder images on successive copy sheets advanced, in seriatum, thereto for substantially permanently fixing the toner powder images to the copy sheets;

means for detecting the temperature of said heat applying means and transmitting a signal indicative thereof; and

means for controlling said heat applying means, said controlling means comparing the time derivative of the signal

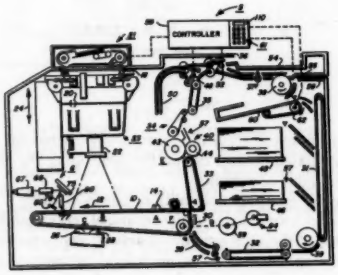
received from said detecting means at initialization of the copy run to a first constant and energizing said heat applying means when the first constant is less than the time derivative of the signal, said controlling means comparing the time derivative of the signal received from said detecting means after the completion of the copy run to a second constant and de-energizing said heat applying means when the second constant is less than the time derivative of the signal, and, after the time derivative of the signal is less than the first constant, said controlling means comparing the signal received from said detecting means during the copy run to a third constant and generating an error signal indicative of the difference therebetween to control said heat applying means.

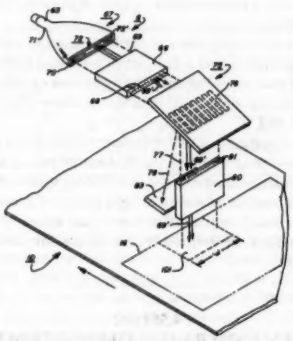
4,551,008

IMAGE ANNOTATOR FOR USE WITH PRINTING AND COPYING MACHINES

Martin E. Banton, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,256
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—14 E **9 Claims**





1. An annotator for use with a copying or printing machine of the type having a recording member such as a photoreceptor; charging means for uniformly charging the recording member in preparation for imaging; means for exposing the recording member to produce a latent electrostatic copy image on the recording member; developing means for developing images on the recording member; and transfer means for transferring developed images to a copy sheet, comprising:

(a) an array of flexible reflective fingers, said fingers being selectively movable between a deflected and an undeflected position;

(b) a light source, said light source being arranged to impinge light across said array of fingers, said fingers reflecting said light in one of said deflected and undeflected positions onto said recording member;

(c) means to apply a deflection potential to discrete ones of said fingers in response to an image signal representing the annotated image to thereby move said discrete ones of said flexible fingers to said deflected position whereby said array produces a light pattern corresponding to said image signal for exposing said recording member and creating an annotated image thereon; and

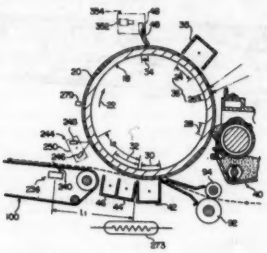
(d) means for synchronizing input of the image signals with the position of said copy image on said recording member whereby to create said annotated image within the borders of said copy image.

4,551,009

ELECTROSTATIC COPYING APPARATUS

Yutaka Shigemura, Takarazuka; Hiroshi Kimura, Habikino; Masahiko Hisajima, Osaka; Isao Yada, Neyagawa; Shinobu Satonaka, Toyonaka, and Seiji Kaminaga, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Dec. 20, 1982, Ser. No. 451,184
Claims priority, application Japan, Dec. 21, 1981, 56-207562; Dec. 28, 1981, 56-212707; Dec. 28, 1981, 56-198684[U]; Dec. 29, 1981, 56-210298; Dec. 29, 1981, 56-210299; Jan. 13, 1982, 57-4216; Jan. 18, 1982, 57-6657; Jan. 19, 1982, 57-7090
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 **6 Claims**



1. An electrostatic copying apparatus comprising

an endless photosensitive member to be rotated sequentially through a latent electrostatic image-forming zone, a developing zone, a transfer zone and a cleaning zone,

a latent electrostatic image-forming means for forming a latent electrostatic image on said photosensitive member in said electrostatic image-forming zone,

a developing means of the magnetic brush type for applying a toner to said latent electrostatic image on said photosensitive member in said developing zone to develop it into a toner image,

a copying paper conveying means for conveying a copying paper through said transfer zone, said conveying means being adapted to convey selectively at least a short copying paper having a length smaller than the total length of said photosensitive member and a long copying paper having a length greater than the total length of said photosensitive member,

a transfer means for transferring said toner image on said photosensitive member to the copying paper in said transfer zone, and

a cleaning blade to be selectively held in said cleaning zone between an operating position at which it is kept in contact with the surface of said photosensitive member and a non-operating position at which it is isolated from said photosensitive member; characterized in that said apparatus further comprises

a detecting means for detecting the copying paper to determine whether it is the short or long copying paper, and

a cleaning control means which, when said copying paper conveyed by said paper conveying means is the long one, holds said cleaning blade at said operating position for a predetermined period of time so that after the transfer, the toner remaining on said photosensitive member is removed by said cleaning blade in said cleaning zone, and when said copying paper conveyed by said paper conveying means is the short one, holds said cleaning blade at said non-operating position and maintains said photosensitive member in rotation for a predetermined period of time while said latent electrostatic image-forming means is out of operation, so that after the transfer, the toner remaining on said photosensitive member is removed by said developing means of the magnetic brush type in said developing zone.

4,551,010

ORIGINAL CONVEYING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

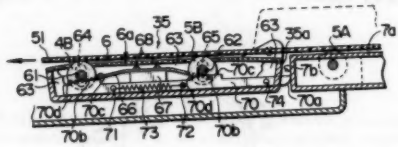
Kiyoshi Miyashita, Hachioji; Fumitaka Ozeki, Inagi, and Hiroshi Tsuda, Mitaka, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1980, Ser. No. 176,262

Claims priority, application Japan, Oct. 23, 1979, 54-136733

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—25 **8 Claims**



1. An original conveying apparatus for an electrophotographic copying machine of an original travelling type, comprising;

a drive roller unit;

a follower roller unit including an original guide surface for guiding an original being conveyed, which surface is adapted to be swingably moved between a first position cooperating with said drive roller unit for conveying a single sheet-shaped original therebetween and a second position for conveying an original having substantial thickness where the original guide surface is being deployed to provide an extension of an original conveying path on the upper surface of the copying machine, said follower roller unit including follower rollers which are movable below said guide surface and are resiliently cooperable with associated drive rollers of the drive roller unit which is provided on the copying machine, to convey the single sheet-shaped original in the first position and which are resiliently urged to partly project through said original guide surface;

a holding member slidably disposed within the follower roller unit to be displaceable between first and second positions in interlocked relationship with the movement of the follower roller unit for allowing the movement of the follower rollers when in the first position, and preventing said follower rollers from moving below said guide surface when in the second position, to forcibly maintain them in a non-resilient manner in said second position partly projecting above the guide surface for rollingly supporting an original having substantial thickness delivered to the follower roller unit by said drive roller unit;

said follower unit further including resilient bias means normally urging said holding member toward its first position; and

a stationary surface for urging said holding member to its second position when said follower roller unit is moved to its second position.

4,551,011

LIGHT SOURCE FOR EXPOSURE

Yoshio Yuasa, Osaka; Hidetoshi Yasumoto, Tondabayashi; Nobukazu Kawagoe, Sakai; Kazuhiko Naruse, Nabari, and Masahito Inaba, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

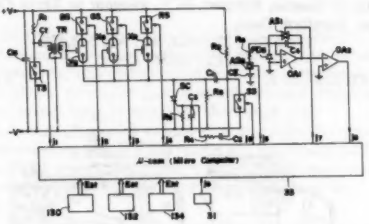
PCT No. PCT/JP82/00462, § 371 Date Aug. 9, 1983, § 102(e) Date Aug. 9, 1983, PCT Pub. No. WO83/02171, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 9, 1982, Ser. No. 527,515

Claims priority, application Japan, Dec. 11, 1981, 56-200496

Int. Cl.[4] G03B *27/72;* **H05B** *37/00*

U.S. Cl. 355—35 **10 Claims**



1. An improved flash illumination system having a microprocessor-based control circuit for controlling the amount of exposure light, comprising:

means for emitting a plurality of pulses of light;

means for providing an exposure signal representative of the value of the total amount of desired light exposure;

calculating means for dividing a light exposure value into a plurality of identical light pulses of a fixed duration and quantity of light;

a detector unit for monitoring the emitted pulses of light and producing a representative signal of the total value of light measured;

means for activating the calculating means to calculate from the exposure signal a first set of identical light pulses of a fixed duration and quantity of light, and causing the means for emitting pulses of light to produce the first set of pulses; and

means for comparing the exposure signal with a measured representative signal of the first set of pulses and producing a difference signal, the calculating means then providing a second set of identical light pulses of a lesser quantity of light based on the difference signal whereby the second set of pulses are emitted by the means for emitting pulses of light.

4,551,012

MICROFILM CAMERA FOR FILMING PUNCH CARDS

Josef Schaut, Freiher von Stein Strasse 8, 6367 Karben 1, and Peter Rüppel, Söderweg 39, Bad Nauheim, both of Fed. Rep. of Germany

Filed Aug. 16, 1984, Ser. No. 642,061

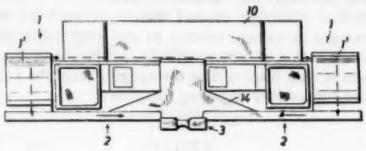
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329804; Aug. 18, 1983, 3320806

Int. Cl.[4] G03B *27/48, 27/50, 27/32, 27/52*

U.S. Cl. 355—50 **12 Claims**

1. A microfilm camera for filming punch cards, consisting of a camera box containing the exposing and processing facilities and with punch card-conveying elements and at least one lateral discharge slot and a punch card collector disposed following said slot, whereby a punch card-reversing facility is

designed and arranged downstream of the at least one slot and in the feeding direction upstream of the collector in a way such



that the punch cards arrive in the collector with their inscribed surface facing down.

4,551,013

ELECTROSTATIC COPYING PROCESS

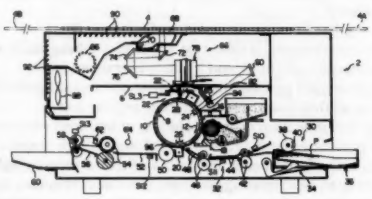
Masahiro Yoshioka, Matsubara; Masahiro Murakami, Shijonawate; Yoichiro Irie, Suita; Tsugio Nakanishi, Osaka; Eiji Tsutsui, Amagasaki; Noriyuki Iwao, Kobe; Junichi Hirobe, Osaka, and Takahiro Wakikaido, Yao, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Sep. 27, 1982, Ser. No. 424,943

Claims priority, application Japan, Nov. 30, 1981, 56-192395

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—55 **4 Claims**



1. In a process for electrostatic copying at variable ratios, including projecting the image of an original document at a variable ratio onto a supporting base having a photosensitive member disposed on the surface thereof and having a paper-separating nonimage area formed outwardly of one side edge of the photosensitive member, to form on the photosensitive member a latent electrostatic image of the original document or a toner image obtained by developing such latent electrostatic image, while leaving as an uncopied portion one side edge portion of the original document projected onto the nonimage area; contacting a copying paper with the photosensitive member, with one side edge portion of the copying paper extending beyond the one side edge of the photosensitive member by a predetermined non-copying width to overlie the non-image area; and transferring the latent electrostatic image or toner image to the copying paper to form thereon a copy of the original document as projected onto the supporting base; the improvement comprising maintaining the size of the uncopied portion constant irrespective of the ratio of copying.

4,551,014

ORIGINAL CARRIER FOR USE WITH AN IMAGE FORMING DEVICE

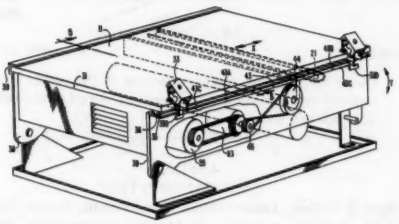
Yoshisugu Nakatomi, Yokohama; Kohachi Uchida, Sagamihara, and Shinichi Hashimoto, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 550,999, Nov. 15, 1983, abandoned, which is a continuation of Ser. No. 302,598, Sep. 15, 1981, abandoned. This application Jan. 24, 1985, Ser. No. 694,482

Claims priority, application Japan, Oct. 28, 1980, 55-151270

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 **9 Claims**



1. In an image forming device having a reciprocating original carrier and a body frame, said original carrier comprising: (a) a glass plate having an upper surface for receiving said original and a lower surface, said glass plate having at least one hole arranged along a longitudinal edge of said glass plate, (b) a first and second guide member each mounted on opposite sides of said body frame for slidably receiving said glass plate to permit its reciprocal movement, (c) cover means hingedly attached to said glass plate for permitting access to said upper surface of said glass, and (d) means for driving said glass plate to cause such reciprocal movement, the improvement comprising: said first and second guide members and said driving means being mounted substantially within the boundaries of said lower surface of said glass plate, wherein at least one of said guide members is mounted directly below said lower surface and has an upper guide element attached along said longitudinal edge of a lower surface of said plate by a fastener through said hole and a lower guide element attached to said body frame, wherein said upper guide element is slidably mounted with respect to said lower guide element and at least one support member being mounted along said longitudinal edge of said glass plate by said fastener, said support member including means for hingedly attaching said cover means to said glass plate.

4,551,015

OVERLAY DEVICES

Hermanus I. Goemans, Blerick, Netherlands, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,032

Claims priority, application United Kingdom, Sep. 20, 1982, 8226792

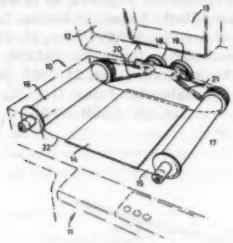
Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 **17 Claims**

1. An automatic overlay device, comprising:

a web carrying a multiplicity of overlays, mounting means for mounting the web such that individual overlays can be extended over a photocopying area, web transport means for moving the web sequentially between a home position where a first overlay is exposed and an end position in which a last overlay is exposed including through a web learning cycle, means for counting the number of overlays during said web learning cycle, information storage means responsive to a signal from the counting means for storing information concerning the number of overlays counted during said web learning cycle, and control means for

allowing a user to select a desired overlay, the arrangement being such that the transport means moves the web to expose the desired overlay in response to a signal from



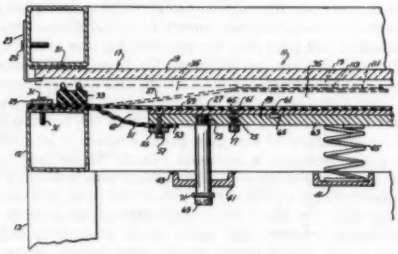
the control means and comparison of the signal from the control means with the information stored in the information storage means.

4,551,016

VACUUM PRINTER

Robert J. Maher, Auburn Heights, and Ronald Tooson, Inkster, both of Mich., assignors to Douthitt Corporation, Detroit, Mich.

Filed Sep. 26, 1984, Ser. No. 654,419
Int. Cl.[4] G03B *27/20*
U.S. Cl. 355—91 **20 Claims**



1. In a vacuum printer for the graphic arts, having a bed, a blanket frame upon said bed including a flexible impervious blanket having a peripheral sealing bead, a glass frame including a glass juxtaposed with the blanket frame and with said glass in snug flexing and sealing registry with said bead, defining a contact printing chamber, means movably mounting the glass frame for opening and closing movements relative to said blanket frame, a vacuum source having a first vacuum conduit communicating with said printing chamber for evacuating said printing chamber; the improvement comprising:

a support mounted upon and underlying said blanket frame;

a non-metallic base plate yieldably positioned within and peripherally spaced from said blanket frame, supportably underlying said blanket;

a plurality of uniformly spaced spring means interposed between said support and said base plate, uniformly supporting said base plate;

a continuous centrally apertured skirt of flexible imperforate material along its outer periphery sealed upon said blanket frame, and along its inner periphery sealed against peripheral portions of said base plate;

said skirt and base plate defining with said blanket a vacuum chamber;

a second vacuum conduit interconnecting said first vacuum conduit and said vacuum chamber initially retaining said blanket upon said base plate; and

a control means connected to said second conduit for simultaneously evacuating said vacuum chamber and regulating its vacuum level with respect to the vacuum level in said printing chamber, and after a preset period cutting off vacuum from said vacuum chamber;

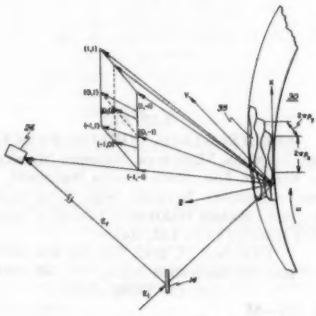
said base plate and blanket thereon adapted for uniform upward movement relative to said glass under the combined action of atmospheric air pressure and said spring means, said blanket then disengaging from the base plate and supportably engaging the glass.

4,551,017

LASER DOPPLER VELOCIMETER FOR MEASURING TORSIONAL VIBRATION

Seetha R. Mannava, Latham; John F. McDonald, Clifton Park, and Henry A. Scarton, Troy, all of N.Y., assignors to General Electric Co., Schenectady and Rensselaer Polytechnic Institute, Troy, both of, N.Y.

Continuation-in-part of Ser. No. 239,704, Mar. 2, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,400
Int. Cl.[4] G01P *3/36;* **G01B** *9/02;* **G01N** *21/41, 29/04*
U.S. Cl. 356—28.5 **9 Claims**



1. An apparatus for measuring velocity of a moving surface, comprising:

a grating-like structure on said surface;

means for directing at least one beam of a substantially monochromatic light onto said grating-like structure;

first and second periodicities, said first and second periodicities being at first and second different angles; and

at least one detection means including at least one photo-detector positioned at a predetermined angle with respect to at least one of said beam and said surface to receive light diffracted by said grating-like structure and effective to produce a first oscillating electrical signal with a first frequency related to a first velocity of said surface in a first direction transverse to said first angle, and to produce a second oscillating electrical signal with a second frequency related to a second velocity of said surface in a second direction transverse to said second angle.

4,551,018

ACOUSTIC EMISSION ANALYZER

Seetha R. Mannava, Latham; John F. McDonald, Clifton Park, and Henry A. Scarton, Troy, all of N.Y., assignors to General Electric Co., Schenectady and Rensselaer Polytechnic Institute, Troy, both of, N.Y.

Continuation-in-part of Ser. No. 426,400, Sep. 29, 1982, which is a continuation-in-part of Ser. No. 239,704, Mar. 2, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,900
Int. Cl.[4] G01P *3/36;* **G01B** *9/02;* **G01N** *21/41, 29/04*
U.S. Cl. 356—28.5 **18 Claims**

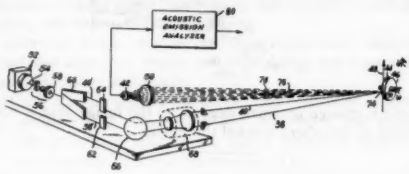
15. A method for measuring an acoustic emission event resulting in surface motion of a body, comprising:

disposing a periodic grating-like structure on said surface,

said grating-like structure being effective to provide a plurality of Bragg diffraction orders in response to an incident light beam;

impinging a first beam of monochormatic light on said grating-like structure to produce said plurality of Bragg diffraction orders;

said Bragg diffraction orders;



deriving a reference beam from said first beam;

heterodyning the intercepted Bragg diffraction order with said reference beam to produce a Doppler signal responsive to said surface motion produced by said acoustic emission event; and

measuring said surface motion in response to said Doppler signal produced by said acoustic emission event.

4,551,019

MEASURING CHROMATIC DISPERSION OF FIBERS

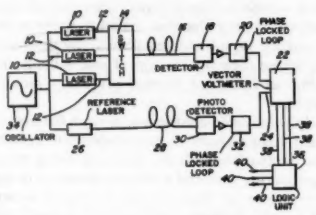
Paul J. Vella, Kanata; Philip M. Garel-Jones, Ottawa, and Richard S. Lowe, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 8, 1983, Ser. No. 521,003

Claims priority, application Canada, Jun. 6, 1983, 429,734

Int. Cl.⁴ G01N *21/84*

U.S. Cl. 356—73.1 **12 Claims**



1. A method for identifying the approximate minimum chromatic dispersion wavelength of an optical fiber comprising:

selecting three test laser diodes having output wavelengths different from one another but located close to a region of low chromatic dispersion (m) of the fiber, in which region m is an approximately parabolic function of wavelength (λ);

identically modulating the test laser diodes and launching output signals therefrom into the test fiber;

detecting light from the test fiber at a remote end thereof and generating corresponding test electrical signals;

from the test electrical signals deriving the difference in propagation time t_1-t_2 of the first and second laser signal propagating along said fiber at respective wavelengths λ_1 and λ_2 and assigning a value of chromatic dispersion $m_{12}=t_1-t_2/\lambda_1-\lambda_2$ at an intermediate wavelength $(\lambda_1+\lambda_2)/2$, deriving the difference in propagation time t_2-t_3 of the second and third laser signals propagating along said fiber at respective wavelengths λ_2 and λ_3 and assigning a chromatic dispersion value $m_{23}=t_2-t_3/\lambda_2-\lambda_3$ at an intermediate wavelength $(\lambda_2+\lambda_3)/2$;

using the values m_{12} and m_{23}, generating a linear function of m in terms of λ corresponding to a differential function of said parabolic region; and

from said linear function deriving the value of λ at which m is 0, such value being the approximate minimum chromatic dispersion wavelength of the optical fiber.

4,551,020

OPTICAL APPARATUS FOR DETERMINING THE INDEX PROFILE OF AN OPTICAL FIBRE

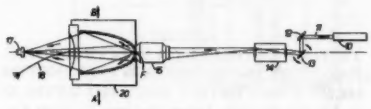
Douglas C. J. Reid, Rugby, and William J. Stewart, Fritwell, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed May 6, 1982, Ser. No. 375,662

Claims priority, application United Kingdom, May 7, 1981, 8113896

Int. Cl.⁴ G01N *21/41, 21/84*

U.S. Cl. 356—73.1 **6 Claims**



1. Optical apparatus for determning the index profile of an optical fibre, said optical apparatus comprising an elliptical reflector, means for holding an optical fibre, the index profile of which is to be determined in a position along the major axis of the ellipse, with the end of the fibre being positioned at one of the foci of said elliptical reflector, means for scanning a beam of light across the surface of said end of said fibre and means located at another focus of said elliptical reflector for detecting said beam of light reflected by said elliptical reflector.

4,551,021

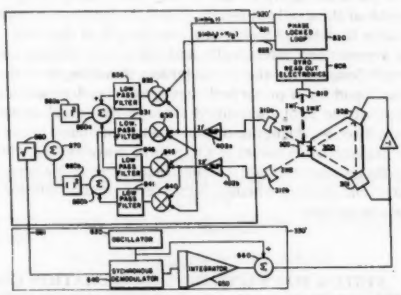
DISCRIMINANT APPARATUS FOR LASER GYROS

Stephen P. Callaghan; Timothy J. Callaghan; Harry A. Gustafson, all of Minneapolis, Minn., and Wah L. Lim, Anaheim, Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 1, 1982, Ser. No. 353,713

Int. Cl.⁴ G01C *19/64*

U.S. Cl. 356—350 **32 Claims**



1. A signalling apparatus for producing an output signal descriptive of a function of the variations in the intensity of a first wave of a first frequency propagating along a wave guide means, and coexisting with a second wave of a second frequency, wherein said intensity variations are due to coupling of energy from one wave into the other along said wave guide means, said signalling apparatus comprising:

intensity detection means, responsive to said first wave, for

producing at least a first intensity signal indicative of the instantaneous intensity of said first wave;

frequency signal means, responsive to said first and second waves, for producing first and second reference signals in phase quadrature with each other and having a frequency value which is a function of substantially the instantaneous value of the frequency difference between said first and second waves;

first means for generating

(i) a first product signal representative of the product of said first intensity signal and said first reference signal, and

(ii) a second product signal representative of the product of said first intensity signal and said second reference signal; and

second means for operating on said first and second product signals and producing an output signal representative of said intensity variations of said first wave.

4,551,022

TESTING METHOD BY A SPECTROSCOPIC PHOTOMETRY USING THREE WAVELENGTHS OF LIGHT AND A DEVICE FOR SAID METHOD

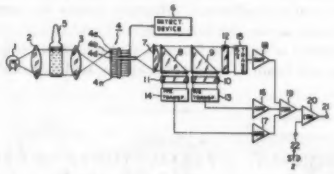
Ryosaku Tagaya, Gunma, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,106

Claims priority, application Japan, Jun. 3, 1982, 57-094011

Int. Cl.[4] G01J *3/50*

U.S. Cl. 356—406 **6 Claims**



1. A testing method using a spectrophotometry of three wavelength values for optically detecting a leak in a transparent or semitransparent vessel by a dye bath method, comprising the steps of: passing a light through said vessel; dividing into three parts the light which has passed through the vessel, said parts being (1) a light having the characteristic wavelength of the dye bath liquid, (2) a light having a wavelength shorter than the characteristic wavelength of dye bath liquid by a prescribed wavelength, and (3) a light having a wavelength longer than the characteristic wavelength of the dye bath liquid by a prescribed wavelength; and measuring the value of the light transmitted through the vessel at each of these three wavelengths; obtaining a transmittance curve from the transmittance values at these three wavelengths; comparing the curvature of said transmittance curve with a prescribed value; and judging whether the vessel is good or inferior from the comparison.

4,551,023

SYSTEM FOR RECORDING INFORMATION ON PHOTOGRAPHIC IMAGE DENSITY AND PROCESS

Kenji Nakauchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

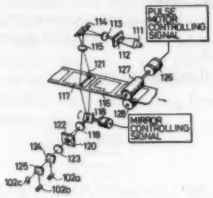
Filed Oct. 5, 1983, Ser. No. 539,244

Claims priority, application Japan, Oct. 6, 1982, 57-175942; Nov. 1, 1982, 57-190783

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—444 **16 Claims**

1. In a system for recording information on the densities of various points of a photographic image such as a negative film by means of photoelectric conversion, the improvement comprising means for eliminating that information on densities



which change by small degrees as the image area is scanned from its periphery toward the center.

4,551,024

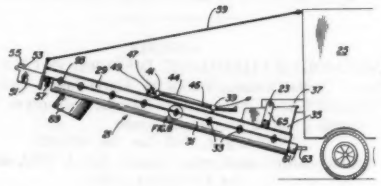
MIXING APPARATUS FOR CEMENTITIOUS MATERIALS

Thomas R. Clapp, P.O. Box 2529, Midland, Mich. 48640

Filed Apr. 24, 1981, Ser. No. 257,162

Int. Cl.[4] B28C *5/14*

U.S. Cl. 366—40 **11 Claims**



1. Apparatus mounted on a vehicle for mixing a cementitious material in which a volatile liquid is employed comprising:

an enclosed mixing chamber sealed to prevent the escape of the volatile liquid and any potentially dangerous fumes;

a solid frame forming the top of said mixing chamber and having an inlet end thereof pivotably mounted on the vehicle;

an easily removable elastomeric trough forming the bottom of said mixing chamber, the elastomeric material selected to be compatible with the materials being mixed;

an auger having a central shaft and mounted in said frame to convey materials through said mixing chamber;

mixing paddles mounted on the shaft of said auger;

a drive motor for said auger mounted on said frame;

a releasable flexible coupling between the aligned shafts of said motor and said auger to permit removal of said auger from said frame;

an inlet hopper to introduce substantially dry material into said mixing chamber;

liquid injection means to introduce a liquid into said mixing chamber at a distance removed from said inlet hopper to have said substantially dry material form a plug to prevent the liquid and any fumes from backing up said inlet hopper; and

a discharge opening formed in said elastomeric trough.

4,551,025

APPARATUS FOR MANUFACTURING SOFT ICE CREAM AND THE LIKE

Theodore Ames, and Vernon E. Brown, Jr., both of Portland, Oreg., assignors to Glacier Products, Portland, Oreg.

Filed Aug. 2, 1984, Ser. No. 637,382

Int. Cl.[4] A23G *9/00*

U.S. Cl. 366—144 **17 Claims**

1. In an apparatus for manufacturing soft ice cream and the like from prepared liquid mixes, said apparatus having a reser-

voir, temperature sensor freezing chamber, compressor, mixer and auger, and dispenser means, said reservoir releasing said prepared mixes into said freezing chamber as needed, said compressor, and said mixer and auger being actuated when said temperature sensor detects a temperature T2 or warmer in said soft ice cream, and being deactuated when said temperature sensor detects a temperature T1 a preset amount cooler than said T2, said apparatus having a start-up and normal mode of operation, a serve mode of operation, and a standby mode of operation, the improvement comprising:

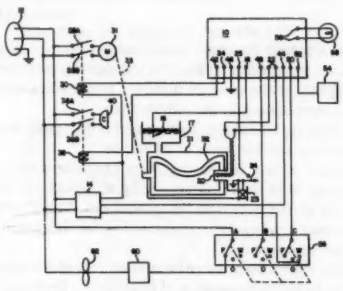
a. controller means responsive to said temperature sensor, and said dispenser means, and controlling said compressor, said mixer and auger;

b. in said start-up and normal mode, said controller means:

1. actuates said compressor, and said mixer and auger whenever said temperature sensor detects a temperature warmer than said temperature T2;

2. turns off said compressor, and said mixer and auger whenever said temperature sensor detects a temperature equal to or cooler than said temperature T1;

3. goes into said serve mode of operation whenever said dispenser means is actuated.



4. goes into said standby mode of operation whenever said dispenser means has not been actuated for a preset period of time;

c. in said serve mode of operation, said controller means:

1. actuates said compressor, and said mixer and auger, whenever said dispenser means is actuated;

2. disables said compressor when said temperature sensor detects a temperature T4 a selectable amount cooler than temperature T1, and enables said compressor when said temperature sensor detects a temperature wrmer than said T4;

3. turns off said mixer and auger, and said compressor when said dispenser means is deactuated, and goes into said start-up and normal mode of operation;

d. in said standby mode of operation, said controller means cyclically:

1. actuates said compressor, and said mixer and auger whenever said temperature sensor detects a temperature warmer than said temperature T3;

2. disables said compressor whenever said temperature sensor detects a temperature cooler than said temperature T4;

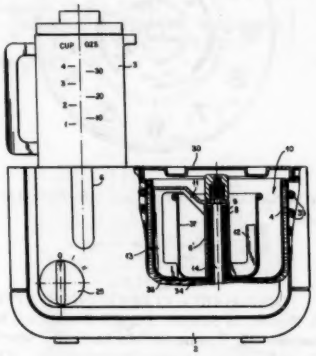
3. goes into serve mode of operation whenever said dispenser means is actuated.

4,551,026

HOUSEHOLD APPLIANCE FOR MAKING ICE CREAM

Guido Cristante, Omegna, Italy, assignor to I.P.E. Nuova Bialetti S.p.A., Crusinallo di Omegna, Italy

Filed Feb. 6, 1984, Ser. No. 577,152
Claims priority, application Italy, Feb. 4, 1983, 20690/83[U]
Int. Cl.[4] A23G *9/00*
U.S. Cl. 366—149 **4 Claims**



1. A device for making ice cream, comprising:

a housing provided with internal cooling means, said housing forming a recessed compartment open at the top and bounded by a peripheral wall in contact with said cooling means;

a drive shaft rising through a mount at the bottom of said compartment, said mount forming a tubular boss surrounding part of said drive shaft;

a freezing vessel provided with a central hub removably fitting onto said boss while leaving a tip of said drive shaft projecting therefrom, said freezing vessel adjoining said peripheral wall with an intervening annular clearance to be filled with brine;

a stirrer removably carried on said tip and provided with paddle means extending into the interior of said freezing vessel for agitating the contents thereof; and

a source of motive power coupled to said drive shaft for rotating same together with said stirrer, said freezing vessel comprising an outer cup and a smaller inner cup separably nested in said outer cup, said paddle means including a lower paddle sweeping the interior of said inner cup and an upper paddle reaching around a rim of said inner cup for sweeping the interior of said outer cup whereby two different types of ice cream can be prepared within said inner cup and between said inner and outer cups respectively.

4,551,027

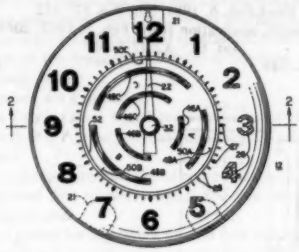
DEVICE FOR DETERMINING TIME OF SUNRISE AND SUNSET

George T. Spruck, 5819 Monfort Hills Ave., Cincinnati, Ohio 45239

Filed Jan. 11, 1982, Ser. No. 338,313
Int. Cl.[4] G04B *19/26*
U.S. Cl. 368—15 **8 Claims**

1. A device for determining the time of solar passage of the horizon which comprises a clock face having hour and minute indications arranged circumferentially thereof, a disc rotatably mounted in overlying relation with the clock face and at a center thereof, solar passage information on the disc, and an alignment indicator on the disc in association with the solar passage information and alignable with a selected position on the hour and minute indications corresponding to a selected longitude so that a line from the center of the disc through a

selected portion of the solar passage information intercepts the hour and minute indications at a time of solar passage for the



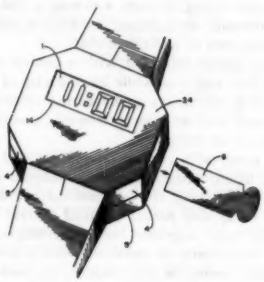
selected portion of the solar passage information at the selected longitude.

4,551,028

DISPOSABLE ELECTRONIC WATCH

John B. Rowen, 20 Summer St., #2, Northboro, Mass. 01532; Christopher M. Rowen, 91 Mechanic St., Marlboro, Mass. 01752, and Charles Janusis, 20 Summer St., #2, Marlboro, Mass. 01532

Filed Dec. 19, 1983, Ser. No. 563,048
Int. Cl.⁴ G04B *1/00, 37/00*
U.S. Cl. 368—204 **7 Claims**



1. A disposable electronic watch comprising:

a case with a plurality of sides and having an upper section with an opening at the top and a lower section containing a plurality of cavities;

a wafer substrate of non-conducting material sandwiched between the said upper and lower sections of said case and having a top side and a bottom side;

a display unit attached to the top side of said wafer substrate and positioned at the said opening of the said upper section of the said case;

an electronic circuit chip for providing timing signals to the said display unit attached to the said bottom side of the said wafer substrate and fitting into one said cavity in the said lower section of the said case;

a battery unit with a top side and a bottom side, seated in one said cavity of the said lower section of the said case and having its said top side positioned against the said bottom side of the said wafer substrate;

a plurality of electrical leads on and through the said wafer substrate operatively connecting said display unit, said elctronic chip and said battery unit; and

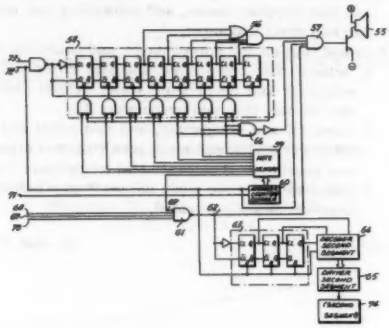
a means for blocking activation of said battery prior to operation of said watch.

4,551,029

ELECTRONIC TIMEPIECE WITH A SOUND GENERATOR

Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 277,292, Jun. 25, 1981, abandoned. This application Sep. 7, 1984, Ser. No. 648,208
Claims priority, application Japan, Jun. 26, 1980, 55-87057; Jun. 27, 1980, 55-87482
Int. Cl.⁴ G04B *21/00;* **G10H** *1/00*
U.S. Cl. 368—273 **14 Claims**



1. A sound generator comprising:

a note generating circuit for outputting a sequence of note signals of the same or different frequencies, each frequency corresponding to an audible note;

an acoustic transducer having said note signals as an input and having audible notes as an output;

memory means for storing data characterizing a note signal along with data characterizing an associated inhibit signal, said stored note data being read out to said note generating circuit in a regular sequence for generating said sequence of the note signals;

inhibit means responsive to at least one inhibit signal for selectively blocking passage of note signals from said note generating circuit to said acoustic transducer; and

means responsive to inhibit signal data, read from said memory means at the same time as the corresponding note data, for transmittal of an inhibit signal to said inhibit means to block passage of a terminal portion of the note signal to the transducer means,

whereby the sound of a second audible note is made distinguishable from a first audible note by the termination of the first audible note.

4,551,030

PROCEDURE AND MEANS FOR EXAMINING THE SURFACE QUALITY OF MATERIALS IN SOLID STATE

Mauri Luukkala, Haukilahdenranta 23 B 5, 02170 Espoo 17, and Ari Lehto, Raekuja 3, 00700 Helsinki 70, both of Finland

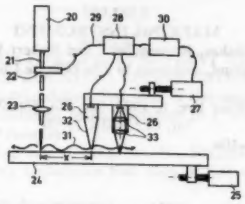
PCT No. PCT/FI83/00023, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03303, PCT Pub. Date Sep. 29, 1983
PCT Filed Mar. 14, 1983, Ser. No. 557,174
Claims priority, application Finland, Mar. 15, 1982, 820884
Int. Cl.⁴ G01N *25/72*
U.S. Cl. 374—5 **15 Claims**

1. A procedure for measuring thermal diffusivity of solid materials, such as metals, coatings and surface layers and thickness and other characteristics of a surface hardening layer, said procedure comprising the steps of

illuminating a surface of a body under examination by an intensity-modulated light beam at a desired frequency to

produce a continuous, progressing thermal wave having a phase angle;

measuring the phase angle of said wave in the direction of said surface at a distance from a spot at which said light beam illuminates said surface of said specimen; and



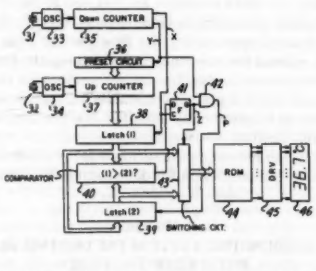
comparing the measured phase angle with a fixed phase reference signal to produce an output signal determined by said phase angle and thereby indicative of the thickness of the surface hardened layer of said specimen.

4,551,031

ELECTRONIC CLINICAL THERMOMETER

Takehiro Ishikawa; Akira Yamazawa, and Yasuo Kusumoto, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 25, 1983, Ser. No. 498,130
Claims priority, application Japan, May 27, 1982, 57-90283
Int. Cl.⁴ G01K *11/22*; H03B *25/00*
U.S. Cl. 374—117 **15 Claims**



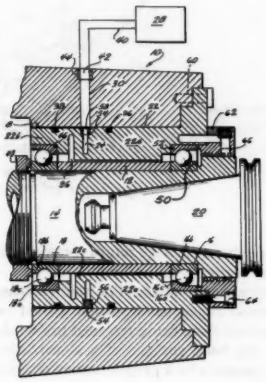
1. An electronic clinical thermometer comprising in combination: a first oscillator having a first temperature coefficient and operable to produce a first oscillating output signal; a first counter connected to receive the first oscillating output signal from said first oscillator; a second oscillator having a second temperature coefficient which differs widely from said first temperature coefficient and operable to produce a second oscillating output signal; a second counter connected to receive the second oscillating output signal from said second oscillator for producing a gate signal; a first memory connected to said first counter for temporarily storing the content of said first counter in response to said gate signal; a second memory connected to said first memory for storing the content of said first memory; a digital magnitude comparator for comparing the content of said first memory with the content of said second memory; means for effecting the transfer of the content of said first memory to said second memory when said comparator judges that the content of said first memory is greater than that of said second memory; switching circuit means for receiving the content of said first memory and the content of said second memory and for selectively producing as an output the content of said first memory when the content of said first memory is greater than that of said second memory, and the content of said second memory when the content of said second memory is greater than that of said first memory; a ROM connected to receive the output of said switching circuit means; a driving circuit connected to the ROM; and indicating means connected to the driving circuit for visually indicating a maximum measurement value.

4,551,032

MECHANISM FOR PRE-LOADING BEARINGS

Frank R. Mottershead, Birmingham, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Jul. 16, 1984, Ser. No. 631,194
Int. Cl.⁴ F16C *33/58*, *43/04*
U.S. Cl. 384—517 **10 Claims**



1. A mechanism of a type comprising a bearing (**18**) for rotatably mounting a first machine tool member (**14**) and means (**22,28**) for pre-loading the bearing (**18**) and supporting the bearing (**18**) and first machine tool member (**14**) with respect to a second machine tool member (**10**), said means characterized by:

a sleeve (**22**) having a first portion (**22*a***) held in immovable relationship by said second member (**10**), a second portion (**22*b***) carrying said bearing (**18**) and displaceable along the axis of said sleeve, and a portion (**22*c***) interconnecting said first and second sleeve portions and displaceable along the axis of said sleeve; and

means (**28**) for controllably urging said interconnecting portion (**22*c***), said second portion (**22*b***) and said bearing (**18**) away from said first portion (**22*a***) to selectively increase the pre-load applied to said bearing (**18**).

4,551,033

SERIAL ELECTRIC PRINTER USING SINGLE UNIDIRECTIONAL MOTOR

Hiroshi Koike; Shuhei Takeuchi, both of Morioka, and Mikio Miyajima, Iwate, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Division of Ser. No. 299,551, Sep. 4, 1981, Pat. No. 4,410,189. This application Apr. 25, 1983, Ser. No. 487,959
Claims priority, application Japan, Sep. 5, 1980, 55-123040
Int. Cl.⁴ B41J *19/20*, *19/62*
U.S. Cl. 400—308 **3 Claims**

1. A serial printer comprising:

(a) a carriage adapted to be shifted from a starting position along a line to be printed;

(b) a print head mounted on said carriage;

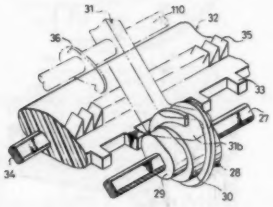
(c) a rack having first and second engagement portions angularly spaced from each other and extending over the shifting region of said carriage;

(d) a reset spring biasing said carriage toward the starting position;

(e) means including a body rotatably mounted on said carriage and having a spiralling tooth portion extending outwardly and adapted to engage said first engagement portion of said rack;

(f) a rotatable shaft splined to said body and extending over the shifting region of said carriage and transmitting rotation to said body to shift said body and carriage along said rack for forward motion by overcoming the force of said reset spring;

(g) rack rotating means for controlling the state of engagement between said rack and said tooth portion of said body and for rotating said rack from said state of engagement to either a carriage return rotative position or a back spacing rotative position; and



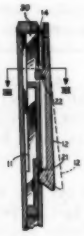
(h) engaging means mounted on said carriage for engaging said second engagement portion of said rack to prevent said carriage from being returned to said starting position during the back spacing of said carriage towards said starting position by a predetermined distance by said reset spring when said rack takes said back spacing rotative position, wherein when said rack takes said carriage return rotative position, said engaging means does not engage with said rack thereby permitting said carriage to be returned to said starting position by the force of said reset spring.

4,551,034

CLIP MOUNT INSERT

Nathan A. Zepell, Santa Barbara, Calif., assignor to June R. G. Zepell, Santa Barbara, Calif.

Filed Jul. 21, 1981, Ser. No. 285,449
Int. Cl.⁴ B43K *7/12, 24/02, 25/00*
U.S. Cl. 401—104 **3 Claims**



1. In a writing instrument having a hollow body and an extendable writing cartridge normally held within the body and having means for holding the writing cartridge selectively in an extended position, an insert assembly for said body, comprising:

(a) an elongated insert having an outer side and an integral transverse hinge bar on said outer side and having a pocket in said outer side;

(b) a clip having an inner side and an outer side and two ends and having a snap-on hinge socket on the inner side open toward one end to snap on over the hinge bar;

(c) a spring disposed in the insert pocket and engaging the insert and the clip to bias the clip about the hinge bar to a gripping position.

4,551,035

MARKING INSTRUMENT

Hugh W. B. Baker, Beaconsfield, and Robert White, Cholsey, both of England, assignors to The Gillette Company, Boston, Mass.

Filed Dec. 6, 1983, Ser. No. 558,658
Int. Cl.⁴ B43K *22/04*
U.S. Cl. 401—104 **8 Claims**

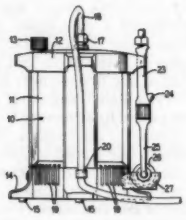
1. A marking instrument comprising a body having a longitudinal bore, a marking element accommodated in the bore, a member received in the bore for moving the tip of the marking element from a retracted position to an extended position relative to the body, detent means on the member and body engageable under a spring bias for locking the member releasably in an extended position in the bore and a projection on the member protruding through the slot and providing means external to the slot for disengaging the detent means and for adjusting the member from a retracted position to an extended position, characterized in that the member is a slide member including a first and a second part, said first part including means to receive the rear end of the marking member so that the marking and slide members are adapted to move together and a plurality of collars in close sliding fit with the bore at positions spaced apart along the first part so that the slide member is guided for movement axially along the bore and so that the first part provides firm lateral support for the writing element, said second part operationally communicating with and projecting longitudinally from the first part and including a resiliently flexible, rearwardly extending arm which is a cantilever spring providing the spring bias for the detent means and carrying said projection for disengaging the detent means.

4,551,036

PAINT DISPENSING SYSTEM INCLUDING ROLLER WITH DRIP TROUGH

Rudolf R. Karliner, Minnetonka, and Samuel R. Carlin, St. Michael, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Apr. 19, 1984, Ser. No. 602,208
Int. Cl.⁴ B05C *17/02*
U.S. Cl. 401—131 **8 Claims**



1. A paint dispensing system comprising a pressure-tight container for holding paint under pressure, said container having spaced vents along a base portion thereof, resilient

securing means on said container, a trough having a pair of spaced tabs extending therefrom and proportioned to be received in said vents to hold said trough in a generally horizontal position, a handle, and a paint roller detachably secured to said handle, said handle being insertable into said resilient securing means to hold said paint roller suspended above said trough.

4,551,037

DEVICE FOR APPLYING PAINT WITH RECIPROCATING LINEAR MOTOR

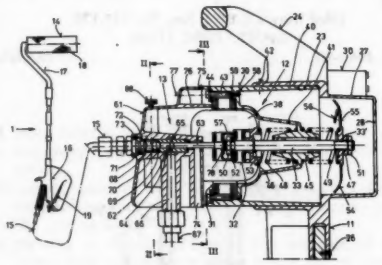
Ewald Kille, Friedrichshafen, Fed. Rep. of Germany, and Rudolf Karliner, Minnetonka, Minn., assignors to J. Wagner GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,253

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222595

Int. Cl.[4] B05C *17/02*; H02K *41/02*

U.S. Cl. 401—146 **17 Claims**



1. A paint applying apparatus which comprises a portable frame having a base adapted to rest on the ground and defining a support for removably receiving a paint reservoir in upright position, an upstanding leg on said base adjacent said support, a housing on top of said leg defining a laterally extending recess opening toward said support, a handle on top of said housing above said recess, casing means having one end projected into said recess and supported by said housing and an opposite end projecting beyond the housing overlying the support at a level to accommodate the reservoir freely thereunder, a motor in said casing means, a paint pump driven by said motor in said casing means, a paint intake tube depending from said pump to extend to the bottom of the paint reservoir mounted on the support, a drain from said pump adapted to communicate with the reservoir on the support for draining paint from the pump to the reservoir, a discharge hose extending from said pump, a paint applicator coupled to said hose, and a manually actuated valve controlling paint flow from the hose to the applicator whereby the frame with the paint reservoir on the support of the base is conventiently carried by the handle, placed on the floor adjacent the area to be painted, the motor energized to drive the pump for drawing paint from the reservoir through the intake tube for delivery through the hose to the applicator under control of the valve, and unused paint is drained back to the reservoir.

4,551,038

WRITING INSTRUMENT TIP

Hugh W. B. Baker, Beaconsfield, and Graham J. Whiting, Stanford-in-the Vale, both of England, assignors to The Gillette Company, Boston, Mass.

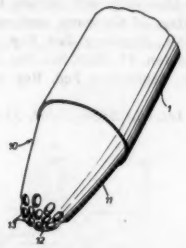
Filed Apr. 25, 1984, Ser. No. 603,633

Claims priority, application United Kingdom, May 6, 1983, 8312584

Int. Cl. B43K *1/00, 1/06*

U.S. Cl. 401—265 **15 Claims**

1. A writing tip for a reservoir pen comprising a hollow, rigid, thin-walled element including a convex wall portion defining an external writing surface carrying more than eight substantially circular or elliptical perforations for conducting ink directly to the writing surface from the interior of the writing tip, said perforations having diameters between about



60 to about 80 microns and having transverse dimensions in the range of 50 to 200 microns and tapering smoothly inwardly from the writing surface and where the edges at the outer ends of the perforations are smoothly radiussed to thereby preclude snagging at the writing surface.

4,551,039

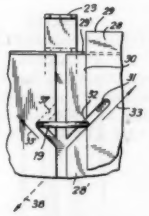
BINDER ASSEMBLY WITH RANDOMLY REMOVABLE LEAVES

Mark T. Basseches, 420 Lexington Ave., New York, N.Y. 10017

Filed Sep. 24, 1984, Ser. No. 653,459

Int. Cl.[4] B42F *3/04, 13/16*

U.S. Cl. 402—60 **12 Claims**



1. A binder device actuatable to enable the random extraction of leaves mounted to said device comprising an elongate spine, at least one generally U-shaped left holder member projecting upwardly from said spine in a plane normal to the longitudinal axis thereof and defining with said spine a closed loop, a blocker member movably mounted to said spine in spaced relation to said holder member, said blocker member being shiftable between a leaf blocking position whereat said blocker member is positioned to prevent movement of leaves mounted on said holder member in the direction of the axis of said spine, and a leaf releasing position whereat leaves mounted on said holder are shiftable in the direction of said axis.

4,551,040

APPARATUS FOR TRANSPORTING ROD-SHAPED ARTICLES BETWEEN THE DISCHARGE ENDS OF PNEUMATIC CONVEYOR PIPES AND A PROCESSING MACHINE

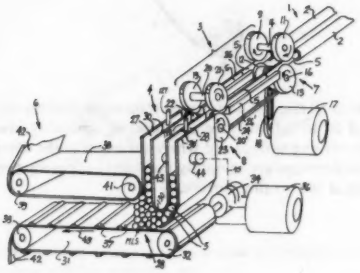
Alois Kasparek, Hamburg, and Jürgen Burger, Marschacht, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. Kg., Hamburg, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,289

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926792

Int. Cl.⁴ B65G *53/66, 51/02*

U.S. Cl. 406—28 **9 Claims**



1. Apparatus for delivering rod-shaped articles, particularly filter rod sections, which constitute or form part of smokers' products to a processing machine which the articles enter by moving sideways, comprising a pneumatic transporting unit including several pneumatic conveyor pipes for moving rod-shaped articles axially and having discharge ends for such articles; means for deflecting successive articles which are delivered by said discharge ends so as to cause the deflected articles to move sideways by gravity, said deflecting means comprising a plurality of upright ducts, one for each pipe of said transporting unit; means defining a junction zone for reception of the thus deflected articles, said ducts having lower ends with openings for admission of articles directly into said junction zone and said junction zone being disposed immediately below said ducts and including means for accumulating a multi-layer stream of articles whose articles move sideways; and a conveyor system for sidewise transport of the multi-layer stream from said junction zone to the processing machine.

4,551,041

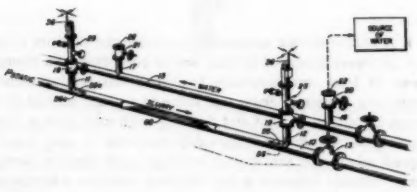
VIBRATION METHOD FOR UNPLUGGING A SLURRY PIPELINE

Julian B. Coon, Ponca City, Okla., and Eston F. Petry, Barrackville, W. Va., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 11, 1984, Ser. No. 619,744

Int. Cl.⁴ B65G *53/66*

U.S. Cl. 406—85 **4 Claims**



1. A method for unplugging a pipeline containing a plugged portion filled with fluids and solid material comprising:

a. injecting pressure pulses into said pipeline upstream and downstream of said plugged portion and against the plugged portion;

b. controlling the frequency and phase of said injected pulses; and

c. forcing fluids under pressure against said plugged portion, whereby said pressure pulses will fluidize said plugged portion and said forced fluid will cause the removal of said plugged portion.

4,551,042

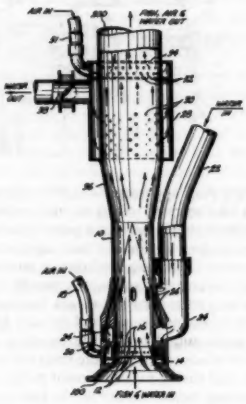
TRANSFER SYSTEM FOR FISH AND SIMILAR ARTICLES

Stanley R. Hagedorn, Lynnwood, and Stewart W. Roach, Seattle, both of Wash., assignors to Marco Seattle, Inc., Seattle, Wash.

Filed May 17, 1984, Ser. No. 611,179

Int. Cl.⁴ B65G *53/40*

U.S. Cl. 406—93 **10 Claims**



1. Apparatus to elevate fish and similar articles undamaged in a transfer conduit, comprising conduit means with a lower end open to receive the articles, air injection pump means overlying said lower end and water injection pump means overlying the air injection pump means and the lower end, the two pump means configured and cooperating together to create relative flow pressures and velocities which transfer the articles in a partially airborne state upwardly in the conduit means substantially free of damage to elevations materially above water level, said conduit means further having:

flow diffuser means overlying said water injection pump means operable to decrease water flow velocity;

water vent ejection means overlying said water injection pump means supplied through openwork in the conduit means wall for withdrawing upwardly flowing water while preventing passage of articles and permitting continued advancement of water upwardly with residual air buoying the articles upwardly in the conduit means;

second air injection pump means adjacent and overlying said water vent ejection means operable at airflow rates buoying the water-borne articles further upwardly in said conduit means; and

means to discharge such articles from said conduit means above said second air injection pump means.

4,551,043
INSERTED TOOTH CUTTER

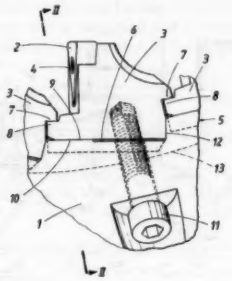
Peter Kirchberger, Haag, Austria, assignor to GFM Gesellschaft Für Fertigungstechnik und Maschinenbau Gesellschaft m.b.H., Steyr, Austria

Filed Jun. 13, 1984, Ser. No. 620,144

Claims priority, application European Pat. Off., Jul. 5, 1983, 83 89 0109.8

Int. Cl.⁴ B26D *1/00*

U.S. Cl. 407—43 **9 Claims**



1. In an inserted tooth cutter comprising

a disc-shaped cutter body having an annular peripheral surface,

an annular series of tooth holders provided on said annular peripheral surface and adapted to hold a plurality of plate-like cutting teeth,

a plurality of fixing elements, which are secured to said cutter body and each of which forces one of said tooth holders against said cutter body,

the improvement residing in that

each of said fixing elements forces one of said tooth holders against said cutter body in a generally radial direction,

said cutter body is formed adjacent to said annular peripheral surface with a plurality of generally radially facing backing surfaces, each of which faces one of said tooth holders, and

each of said tooth holders extends generally in the peripheral direction of said cutter body and is formed near one end with a generally radially facing bearing surface portion engaging one of said backing surface portions, and with a first longitudinal extension, and is formed at its other end with a second longitudinal extension, which forms a shouder that radially faces said cutter body and peripherally overlaps and radially engages said first longitudinal extension of an adjacent tooth holder on the side thereof which is radially opposite to said cutter body.

4,551,044
RADIALLY ADJUSTABLE TOOL HEAD OF A CUTTING MACHINE

Robert Schultschik, Uster, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Apr. 25, 1983, Ser. No. 488,534

Claims priority, application Switzerland, May 3, 1982, 2697/82

Int. Cl.⁴ B23B *29/034*

U.S. Cl. 408—185 **13 Claims**

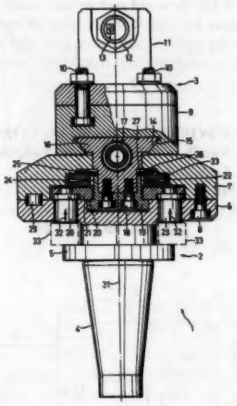
1. A radially adjustable tool head for a cutting machine, comprising:

a spindle insert defining a spindle axis;

a radially adjustable slide supported by said spindle insert and provided with guiding surfaces, with means for mounting a cutting tool and with means for radially adjusting said radially adjustable slide in relation to said spindle axis;

a guiding element arranged between said spindle insert and said radially adjustable slide for axial movement substantially parallel to said spindle axis and containing guiding surfaces upon which slide associated ones of said guiding surfaces provided at said radially adjustable slide;

spring means loaded with a pre-bias between said guiding element and said spindle insert and arranged to press said guiding surfaces of said guiding element against said guiding surfaces at said radially adjustable slide; and



means movable substantially parallel to said spindle axis for interrupting the transmission of said spring pre-bias to said guiding surfaces in order to enable a motion of said guiding element substantially parallel to said spindle axis which is prerequisite for radial adjustment of said radially adjustable slide by said means for radially adjusting said radially adjustable slide.

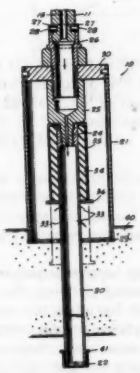
4,551,045
COUNTERSINK CORE DRILL ASSEMBLY AND METHOD OF UTILIZING SAME

Joseph Bossler, 421 S. Baldwin Ave., Arcadia, Calif. 90016

Filed Mar. 12, 1984, Ser. No. 588,229

Int. Cl.⁴ B23B *51/04*

U.S. Cl. 408—206 **9 Claims**



1. A countersink core drill for use in drilling a stepped bore in a concrete slab, wall or the like comprising:

concentric inner and outer core drills including a relatively

long smaller diameter inner core drill having its forward end projecting substantially beyond the forward end of said larger diameter outer core drill;

a cutting ring attached to the forward end of each of said core drills;

means for detachably securing the rear ends of said inner and outer drills as a unit to the rotary shank of a power unit;

the main body of said inner drill having outlet openings in the wall thereof for a chip flushing fluid positioned rearwardly of the forward end of said outer drill; and

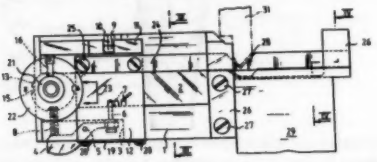
closure means for said outlet openings movably supported between the ends of said outer drill and movable between positions to control flow from said openings.

4,551,046

DEVICE FOR REPRODUCING CODED KEYS

Henry Kinas, Neuilly S/Seine, France, assignor to Societe Anonyme H.K. France, Paris, France

Filed Aug. 9, 1983, Ser. No. 521,553
Claims priority, application France, Aug. 12, 1982, 82 14243
Int. Cl.[4] B23C *1/16*
U.S. Cl. 409—82 **2 Claims**



1. Device for reproducing coded keys adapted to machines for reproducing keys by scanning and comprising a rotary cutter and a follower adapted to be displaced simultaneously in two orthogonal directions, wherein said device comprises a support, a first carriage mounted to move with respect to the support, a second carriage mobile with respect to the first and bearing a bar provided with a single notch whose shape is that of the notches of the key to be reproduced, the two carriages being mobile respectively in the longitudinal direction of the bar and in the direction of the depth of the notch thereof, means for immobilising one of the carriages in one of several marked positions each corresponding to one of the possible locations for the notches of the key to be reproduced, and means for immobilising the other carriage in one of several marked positions each corresponding to one of the possible depths for these notches.

4,551,047

ROUTER DEVICE

Dalby L. Price, 2650 SW. Mitchell, Portland, Oreg. 97201

Continuation-in-part of Ser. No. 302,174, Sep. 14, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,392
Int. Cl.[4] B23C *1/20*
U.S. Cl. 409—182 **1 Claim**

1. A router device for processing a workpiece comprising

a portable housing adapted to be moved over the workpiece being processed having wall structure defining at the base thereof a compartment which opens to the base of the housing,

workpiece-engaging support structure mounted on the outside of said housing defining the contact plane of the router device and first adjustable means enabling pivoting of the housing relative to said contact plane,

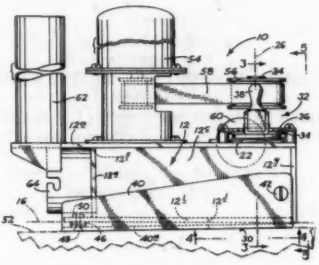
a cutter shaft and means mounting said shaft with the axis thereof substantially upright relative to said contact plane but inclined from perpendicularity to said contact plane, said cutter shaft having a bottom end within said compartment and extending upwardly from said compartment to an upper end above said housing structure,

a bearing mounted in said housing structure above said compartment rotatably supporting said shaft,

second adjustable means for shifting said bearing and the shaft that it supports in a direction extending axially of the shaft,

means disposed above said housing for producing shifting of said bearing and locking of said bearing in a given adjusted position;

a motor mount on the top of said housing and power transmitting means connecting said motor and said cutter shaft above said housing,



a cutter mounted on the bottom end of said shaft and disposed within said compartment moving on rotation of the shaft in a cutting plane which is disposed normal to the axis of the shaft and obliquely intersecting said contact plane,

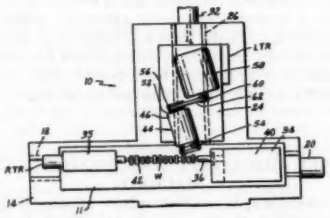
axial shifting of said bearing and the shaft it supports serving to vary the location of the intersection of said cutting plane with said contact plane and adjustment of said first adjustable means serving to vary the angularity of the intersection of the cutter plane with said support plane.

4,551,048

MILLING MACHINE

James D. Phillips, Posen, and Robert L. Sheets, Troy, both of Mich., assignors to J. D. Phillips Corporation, Alpena, Mich.

Filed Jun. 27, 1983, Ser. No. 508,084
Int. Cl.[4] B23C *3/04*
U.S. Cl. 409—197 **8 Claims**



1. A machine for milling an eccentric cam on a cam shaft, comprising means for supporting and rotating the cam shaft about its longitudinal axis, a milling cutter comprising a rotatable milling head, said head having a front face adjacent to the cam shaft, a plurality of cutting elements having cutting edges and mounted on an annular portion of said front face of said head in a circular array about the axis of rotation of said head such that, when said head is rotated about its axis of rotation, said cutting edges move in a path which defines the surface of a frustum of a cone concentric with the axis of rotation of said head, means for supporting said head with its front face in confronting relation to the cam shaft and with its axis of rotation at an acute angle to the longitudinal axis of the cam shaft

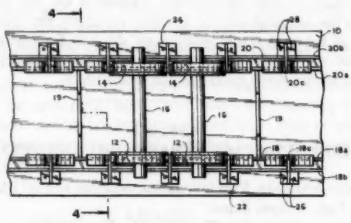
such that when said head is rotated the path of said cutting edges lies in a plane which forms and acute angle with the longitudinal axis of the cam shaft and such that the cutting elements successively engage the cam on the cam shaft, power means for feeding said milling head toward and away from the cam shaft in a path at right angles to said longitudinal axis of the cam shaft in accordance with the contour to be milled on the eccentric cam, and means for rotating said head, said cutting elements each taking a progressive cut beginning at a point on one side edge of said cam which has a substantial force vector component axially of the cam shaft and ending in a line across the full width of the cam having a force vector substantially perpendicular to the cam shaft and in which the cutting element edge is substantially parallel to the longitudinal axis of the cam shaft.

4,551,049

APPARATUS FOR TRANSPORTING WHEEL AND AXLE ASSEMBLIES

Lawrence Klosk, 3977 Sedgwick Ave., Bronx, N.Y. 10463

Filed Nov. 19, 1982, Ser. No. 442,909
Int. Cl.⁴ B60P *7/12*
U.S. Cl. 410—42 **4 Claims**



1. A rack for transporting railroad car wheel and axle assemblies on the flatbed of a vehicle, the assemblies being of the type where each wheel includes an outwardly extending flange, the rack comprising first and second substantially parallel elongated parts, means extending in a first direction generally parallel to the axles of the assemblies for spacing said parts a distance sufficient to receive the flanges therebetween, so as to prevent relative movement between the assemblies and said parts in said first direction, means for fastening said spacing means to the vehicle bed, each of said parts comprising first and second spaced members, each of said members comprising a base, a rigidity enhancing member mounted to said base, and extending in said first direction, and an upstanding element mounted on and extending from said rigidity enhancing member, in a second direction substantially perpendicular to said first direction, said element comprising a surface contoured in accordance with the curve of the wheel, said elements on adjacent members being oppositely oriented along said second direction and cooperating to form a wheel receiving recess therebetween so as to prevent relative movement between the assemblies and said elements in said second direction.

4,551,050

THREADED ENGAGEMENT MEANS

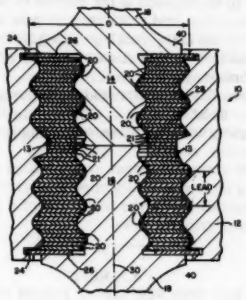
Robert W. Hughes, and James F. Cantrel, both of Northampton, Pa., assignors to Ingersoll-Rand Company, Woodcliff, N.J.

Filed Jul. 11, 1983, Ser. No. 512,215
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.⁴ F16B *37/12;* **E21B** *17/042*
U.S. Cl. 411—436 **18 Claims**

1. An improved threaded engagement means, having a body with a central axis, said body comprising means defining a first wall which is substantially smoothly threaded, and of a given pitch diameter, and which circumscribes said axis, wherein the improvement comprises:

means engaging and lining said first wall defining a second, threaded wall, having a pitch diameter which differs from said given diameter, which also circumscribes said axis; wherein

said second wall has an exposed surfacing which, on a radial plane drawn outwardly from said axis, is defined by a plurality of juxtaposed, rigid surfaces; and



the axial median of any one of said rigid surfaces, of a plurality thereof, measured along said radial plane, is disposed at a given distance from said axis; and

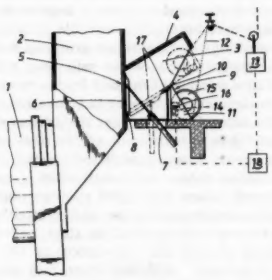
the axial median of another such surface immediately adjacent to said one surface, measured along said plane, is disposed at a radial distance from said axis other than said given distance.

4,551,051

APPARATUS FOR CHARGING A ROTARY KILN WITH PNEUMATIC TIRES

Edwin Hofbauer, Sulz; Peter Lechner, and Heribert Exler, both of Kaltenleutgeben, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 19, 1983, Ser. No. 533,308
Claims priority, application Austria, Oct. 15, 1982, 3792/82
Int. Cl.⁴ F23K *3/00;* **G01G** *13/00*
U.S. Cl. 414—21 **5 Claims**



1. In apparatus for charging pneumatic tires up to a predetermined maximum diameter to a rotary kiln having an end inlet, comprising

a lock chamber structure having a kiln end adapted to be connected to said end inlet and a receiving end opposite to said kiln end, said lock chamber structure comprising a kiln end gate and a receiving end gate at said kiln end and said receiving end, respectively, and

gate-actuating means for opening said kiln end gate and said receiving end gate in alternation,

the improvement residing in that

said lock chamber structure has a runway which has a rear end disposed in the interior of said lock chamber structure adjacent to said receiving end and is downwardly inclined in the direction from said rear end to said kiln end when said kiln end gate is open and said receiving end gate is closed has a length which is at least twice said maximum diameter,

said receiving end gate carries a tire holder which is arranged to be disposed in the interior of said lock chamber structure when said receiving end gate is closed,

said tire holder comprises a gripping device for holding a tire at said rear end of said runway in a position for rolling on said runway,

said gripping device comprises two gripping jaws, which are mounted to be movable in a direction which is parallel to said runway and transverse to the longitudinal direction of said runway, and

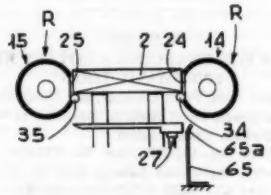
tire holder actuating means are provided for moving said gripping jaws in mutually opposite directions into and out of engagement with the side walls of a tire disposed between said gripping jaws.

4,551,052

DEVICE FOR FORMING, FROM THE TOP DOWNWARDS, ARTICLES INTO A STACK OF ORDERLY LAYERS

Domenico Pattarozzi, Bologna, Italy, assignor to B.S.P. Packaging Systems di Pattarozzi D. & C.s.a.s., Bologna, Italy

Filed Sep. 13, 1983, Ser. No. 531,662
Claims priority, application Italy, Sep. 16, 1982, 3533 A/82
Int. Cl.[4] B65G *57/06*
U.S. Cl. 414—81 **11 Claims**



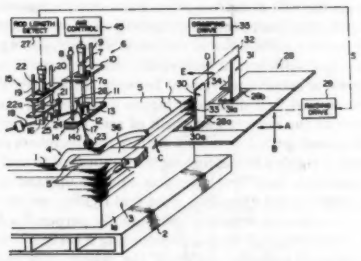
1. Device for forming, from the top downwards, articles into a stack of orderly layers, comprising a longitudinal line for infeeding oriented identical articles; a support base for said infeeding lines, a horizontal plate movable vertically between two extreme positions, both extreme positions being beneath the horizontal support base of the said line; a first station means, placed downstream of the said line to receive from the line the said articles without varying the elevation or the orientation thereof; a second station means that cooperates with the aforementioned plate downstream of the first station, said second station means forming with the articles forthcoming from the first station means, one longitudinal layer of articles placed transversely above the upper extreme position of the said plate, and means to transfer the said layer either onto the plate or onto the topmost layer of the stack under formation thereon, without altering the orientation or the horizontal arrangement of the said transferred layer, said second station means comprises two identical side by side rollers that extend, commencing at the first station means, longitudinally of the line at the same elevation in such a way as to be positioned with the facing surfaces thereof away from one another at a distance no less than the transverse dimension of the said articles, said rollers having operative and non-operative positions; said transfer means intermittently driving, at the same instantaneous speeds, the said rollers in counter-rotating directions between identical stationary non-operative positions, each of which is reached from the preceding one through one revolution of the said rollers, the operative position being when the rollers are driven between the non-operative positions to transfer said layer either onto the plate or onto the topmost layer of the stack under formation thereon; two longitudinal sustaining strips, each locked externally to a corresponding roller and having one extremity in the region of the first station, the said sustaining strips defining, with the rollers in the non-operative position, a horizontal channel for receiving the articles coming from the first station means and for supporting the lower longitudinal edges of the articles at an elevation coplanar with the support base of the first station means; a first sensor means for detecting the formation of one layer in the said channel and for subsequently setting the said transfer drive means in operation; a second sensor means for detecting the non-operative position of the said rollers following the transfer of one layer of articles to be supported by said plate; movable position locator means situated in proximity of the vertical separation plane of the said first station means and of the said second station means, subjected to the said rollers and able to adopt two characteristic positions of non-interception and of interception of the first article in the row of articles present in the first station means, respectively, in corresponding synchrony with the non-operative and the operative position of the said rollers; means for regulating the longitudinal extension of the layer under formation in the said channel; means for regulating the distance the said rollers are apart; means for guiding vertically the transverse sides of the stack under formation on the said plate; means for aligning and/or guiding vertically the longitudinal sides of the said stack; and sensor devices for operating the vertical drive means of the said plate interdependently connected to the drive means of the said rollers.

4,551,053

SHEET SUB-STACK SEPARATING AND FEEDING APPARATUS

Teruhiko Ishibashi, Yoshida, Japan, assignor to Fuji Photo Film Co. Ltd., Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,987
Int. Cl.[4] B65H *33/02*
U.S. Cl. 414—114 **12 Claims**



1. An apparatus for separating and feeding sheet sub-stacks which comprises:

(i) a sheet sub-stack holding-down means for holding a stack of sheets, which are independently laid one upon the other, from above said stack at a position spaced inwardly from a side end face of said stack,

(ii) a level detecting means for detecting the level of a sheet in a predetermined position as numbered consecutively from the uppermost sheet of said stack,

(iii) a sheet sub-stack raising member positioned in face-to-face relation to said side end face of said stack for movement in an approximately horizontal direction between an intervening position where it intervenes in said stack and a retracted position away from said stack and for movement in the vertical direction,

(iv) a sheet sub-stack grasping means for grasping a predetermined number of said sheets as one sub-stack from the side

of said side end face of said stack, said sheet sub-stack grasping means being capable of moving in the vertical direction and in an approximately horizontal direction,

(v) a raising member driving device for adjusting the level of said sheet sub-stack raising member in said retracted position so that said sheet sub-stack raising member stands face to face with a space between said sheet in said predetermined position as numbered consecutively from the uppermost sheet of said stack, which is detected by said sheet level detecting means, and the sheet under said sheet in said predetermined position, for feeding said sheet sub-stack raising member in an approximately horizontal direction up to said intervening position, for lifting up said sheet sub-stack raising member by a predetermined distance in said intervening position, and for then moving down said sheet sub-stack raising member to a position for holding down the sheet under said sheet in said predetermined position,

(vi) a grasping means driving device for moving said sheet sub-stack grasping means to a position for grasping a side end portion of the sheet sub-stack comprising the predetermined number of said sheets, said side end portion being raised by said sheet sub-stack raising member on the side of said side end face of said stack, for causing said sheet sub-stack grasping means to grasp said side end portion of said sheet sub-stack, and for then moving said sheet sub-stack grasping means in an approximately horizontal direction to separate said sheet sub-stack from the upper section of said stack, and

(vii) a sheet sub-stack holding-down means controlling device for adjusting said sheet sub-stack holding-down means to a stack holding-down position at least as long as said sheet sub-stack raising member is moved in contact with said stack.

4,551,054

DEVICE FOR THE PARKING OF AUTOMOBILE VEHICLES

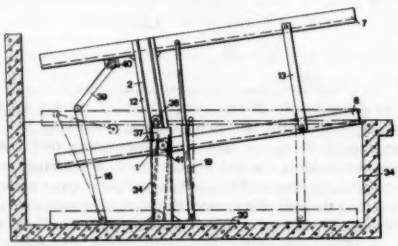
Kaspar Klaus, Dr.-Berndl-Str. 5, 8940 Memmingen, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,676

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1983, 3309100

Int. Cl.⁴ E04H *6/06*

U.S. Cl. 414—229 **7 Claims**



1. A device for parking automobile vehicles comprising:

an upper and a lower platform;

means to support said platforms in vertical spaced relationship;

means to raise and lower both of said platforms between a lower, horizontal position and an upper, tilted position;

a pair of substantially rectilinear coordinated trackways disposed laterally at each side of said platforms and extending substantially alongside each other when said platforms are in a lowered position to define an acute angle therebetween when viewed from the side, said pair of trackways on each side of the platform extend beneath said upper platform in both the raised and lowered positions;

a first one of each pair of coordinated trackways being fixed;

a second one of each pair of coordinated trackways being connected to said platforms and movable therewith; and

guide elements cooperatively engaging said trackways;

one of said guide elements being a fixed guide element cooperatively engaging each second trackway.

4,551,055

APPARATUS FOR CHARGING SOLIDS UNDER COMPRESSION INTO A RECEPTACLE

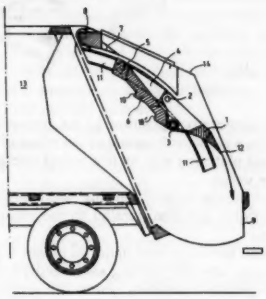
Claude Demenais, Rochefort, France, assignor to Societe Industrielle de Transports Automobiles "SITA" , France

Filed Jul. 20, 1983, Ser. No. 515,560

Claims priority, application France, Jul. 23, 1982, 82 12876

Int. Cl.⁴ B65F *3/20*

U.S. Cl. 414—293 **13 Claims**



1. Apparatus for charging material under compression into receptacle (13) from a hopper (9); said apparatus comprising at least first and second compression elements (1, 6), an elongated guide means (11) for guiding the movement of said first and second compression elements (1, 6), and first and second drive means (4, 7); said first and second compression elements (1, 6) having respective spaced first and second pivotal connection regions; a first pivotal connection means (3) pivotally connecting together said first connection regions of said first and second compression elements (1, 6); second and third pivotal connection means (2, 5) connected to said second pivotal connection regions of said first and second compression elements (1, 6) respectively; said second and third pivotal connection means (2, 5) being slidably guided by said guide means (11) and movable along respective paths defined by said guide means; said first and second drive means (4, 7) each having first and second connection regions respectively which are operable to be variably spaced apart; said first connection region of said first drive means (4) connected to said third pivotal connection means (5); said first connection region of said second drive means (7) connected to a fixed pivot (8); said second connection region of each of said first and second drive means (4, 7) connected to said second pivotal connection means (2).

4,551,056

AUTOMATIC HANDRAIL FOR PLATFORM LIFT

Melvin G. Risner, Carey, Ohio, assignor to REB Manufacturing, Inc., Carey, Ohio

Filed Sep. 1, 1983, Ser. No. 528,393

Int. Cl.⁴ B60P *1/46*

U.S. Cl. 414—539 **12 Claims**

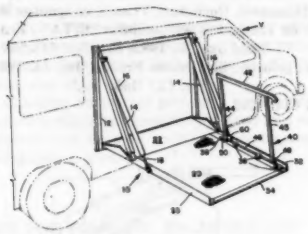
1. An automatic handrail for a foldable lift platform comprising:

(A) a lift platform hinged along one side thereof for oscillatable movement from a vertical inoperative position to a horizontal operative position, and vice versa;

(B) reciprocal motor means having its operative means pivotally journalled to said platform along an axis parallel to the axis of said hinge for oscillating said platform;

(C) a cam arm attached to said pivotally journalled motor operative means for oscillation with the movement of said platform;

(D) a handrail means in a plane having a shaft along its lower side journalled to said platform along an axis orthogonal to the axis of said hinge for said platform for oscillating movement from an inoperative position in a plane parallel to the plane of said platform when said platform is in its



vertical inoperative position to an operative horizontal position in a plane orthogonal to the plane of said platform when said platform is in its horizontal operative position, and vice versa;

(E) resilient means normally urging said handrail means into its inoperative position parallel to the plane of said platform, and

(F) cam plate means on said handrail means for engagement by said cam arm for moving said handrail means into its vertical operative position against the action of said resilient means when said platform is moved into its horizontal operative position.

4,551,057

DEVICE FOR EMPTYING CONTAINERS INTO A COLLECTOR

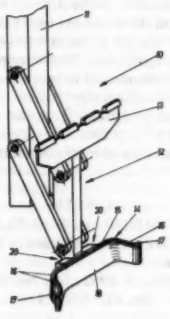
Jakob Naab, Mainz-Laubenheim, Fed. Rep. of Germany, assignor to Zoller-Kipper GmbH, Mainz-Laubenheim, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,843

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 8207261[U]; Mar. 16, 1982, 8207262[U]

Int. Cl.⁴ B65F *3/04*

U.S. Cl. 414—420 **26 Claims**



19. In a device for emptying dustbins to a dust car wherein a lifting and tilting frame is attached to the lower region of the swivel arm of a tipping device, said lifting and tilting frame being provided with a dustbin lifting member at an upper portion thereof and a contact element at a lower portion thereof engageable with the body of the dustbin, the improvement wherein in combination:

said contact element is a bow-shaped bar having outward ends;

said bow-shaped bar is provided with at least one yieldable buffer and dumping device extending along the length of said bar at least between said ends for engaging a container to be emptied, upon the lifting of said container by said member; and

an impact protective safety device is provided at said outward ends of said bow-shaped bar and is formed by elastic shock absorber elements made of rubber or a resilient plastics material, each one of said elastic shock absorber elements being mounted to each one of said outward ends of said bow-shaped bar.

4,551,058

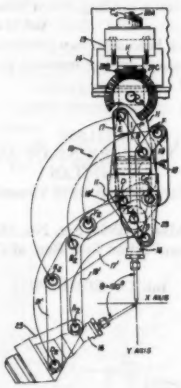
LOW COST ARTICULATING/ARTICULATING AND ROTATING WRIST MECHANISM FOR AUTOMATIC MACHINE TOOL AND AUTOMATIC MACHINE TOOL EMPLOYING THE SAME

Ralph S. Mosher, Clifton Park, N.Y., assignor to Robotics, Inc., Ballston Spa, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,467

Int. Cl.⁴ B25J *17/02*

U.S. Cl. 414—735 **24 Claims**



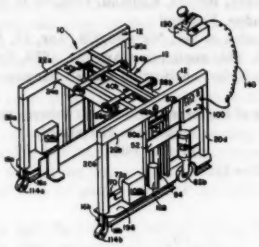
1. An articulating wrist for an automatic machine tool having an automatically driven tool positioning member for automatically positioning and manipulating a working tool at a desired point in space, said wrist comprising tool holding means for holding an end effector tool, articulating means pivotally supporting said tool holding means at one end thereof for rotating the end effector tool through an arcuate path lying within an x-y plane of tool rotation at a point displaced from the axis of rotation of the articulating means, a base member, reversible drive shaft means rotatably supported on said base member, restraining means pivotally coupled to said articulating means and fixed to and driven by said reversible drive shaft means for kinematically rotating the articulating means in either direction from a neutral starting position about its axis of rotation along an arcuate path extending up to plus or minus 150 degrees from the starting position to thereby cause the end effector tool to reproduce about the displaced axis an extended arcuate path of rotation similar to that of the articulating means about its own axis of rotation, and said articulating means and restraining means being proportioned and arranged relative to each other to permit freedom of movement of the wrist mechanism in either direction from its neutral starting position.

4,551,059

MULTI-DIRECTIONAL STRADDLE-LIFT CARRIER

Salvatore R. Petoia, Brick Town, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1983, Ser. No. 548,047
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—459 3 Claims



1. A multi-directional straddle-lift carrier comprising:

(A) a frame having a generally inverted U-shaped cross-section and formed for straddling a load;

(B) adjustment means disposed between the sides of said frame for adjusting the space between the sides of said frame, said adjustment means comprising:

(1) telescoping means connected between the sides of the frame for moving the sides of the frame toward or away from each other, said telescoping means comprising:

(a) a first pair of channeled members parallely spaced and extending horizontally from the top of one side of the frame,

(b) a second pair of channeled members parallely spaced and extending horizontally from the top of the other side of the frame, said second pair of channeled members sharing a common plane with and spaced such that they fit between said first pair of channeled members,

(c) a first cross-member fastened between the free ends of said first pair of channeled members,

(d) a second cross-member fastened between the free ends of said second pairs of channeled members, and

(e) a plurality of guide-rollers fastened to said second pair of channeled members for engaging with said first pair of channeled members such that said first and second pairs of channeled members may slide relative to each other, and

(2) actuator means for adjusting the length of said telescoping means whereby the width of the frame may be adjusted, said actuator means comprising:

(a) first threaded bearing means affixed to the first cross-member between the first pair of channeled members,

(b) first bearing means affixed to the top of one side of the frame between the second pair of channeled members for supporting a first threaded shaft formed to be rotated therein and having an unthreaded section at one end, said first threaded shaft being threaded through said first threaded bearing means and having its unthreaded end supported by said first bearing means,

(c) stop means for prohibiting longitudinal movement of said first threaded shaft relative to said first bearing means, and

(d) means for rotating said first threaded shaft whereby the width of the carrier frame may be adjusted;

(C) means for moving the first and second pairs of channel members relative to each other and comprising:

(1) second threaded bearing means affixed to the second cross-member between the second pair of channeled members,

(2) second bearing means affixed to the top of the other side of the carrier frame between the first pair of channeled members for supporting a second threaded shaft formed to be rotated therein and having an unthreaded section at one end, said second threaded shaft being threaded through said second threaded bearing means and having its unthreaded end supported by said second bearing means,

(3) stop means for prohibiting longitudinal movement of said second threaded shaft relative to said second bearing means, and

(4) means for rotating said second threaded shaft with said first threaded shaft whereby the width of the carrier frame may be adjusted;

(D) steering and traction means mounted on the frame for moving and turning said straddle-lift carrier, said steering and traction means comprising:

(1) two steering and traction units, each unit comprising:

(a) a traction wheel rotatably mounted on the carrier frame,

(b) first propulsion means for applying traction to said traction wheel and comprising:

(i) a first electric motor, and

(ii) first transmission means for transmitting torque from said electric motor to the traction wheel, and

(c) second propulsion means for rotating said traction wheel about its vertical axis, whereby the straddle-lift carrier may be driven and steered in a desired direction, said second propulsion means comprising:

(i) a second electric motor, and

(ii) second transmission means for translating rotation of said second electric motor into rotation of traction wheel about its vertical axis, whereby the direction of travel of the straddle-lift carrier may be varied;

(E) control means for controlling said steering and traction means whereby said straddle-lift carrier may be moved in a desired lateral direction, said control means comprising:

(1) a remote control unit comprising:

(a) housing means for containing the control unit circuit components,

(b) a cover for enclosing said housing means, said cover having an arched ridge and a longitudinal slot along the top of said arched ridge,

(c) a control handle protruding through said longitudinal slot, said control handle being adapted for motion along said longitudinal slot for generating forward and reverse drive control signals, said control handle also being adapted for rotation about its own axis for generating steering and turning control signals,

(d) a mode selection switch, and

(e) means for transmitting electrical control signals to the straddle-lift carrier, whereby said carrier may be remotely operated; and

(F) lifting means disposed on either side of the frame for engaging and elevating a load when the load has been straddled by said carrier, said lifting means comprising:

(1) a pair of hydraulically actuated unit disposed interior to and on either side of the carrier, each unit comprising:

(a) a first pair of vertical members parallely disposed on the side of the carrier,

(b) a hydraulic cylinder rigidly mounted to said vertical members, said hydraulic cylinder being disposed to operate in a vertical direction, and

(c) forklift means for engaging and supporting a load, said forklift means operatively connected to said hydraulic cylinder such that operation of said hydraulic cylinder will be translated into raising and lowering of said forklift means which further comprises:

(i) a horizontal beam,

(ii) two lifting tines adjustably disposed at either end of said horizontal beam for engaging the load,

(iii) a second pair of vertical members fixedly attached to said horizontal beam and disposed for slidably engaging with the first pair of vertical members, and

(iv) tension means operatively connected between said second pair of vertical members and the hydraulic cylinder such that vertical motion of the hydraulic cylinder will cause vertical motion of said second pair

of vertical member whereby the forklift means may be raised and lowered.

4,551,060

DEVICE FOR RAISING VARIOUS LOADS, PARTICULARLY TROLLEYS FOR HANDICAPPED PERSONS, ON VEHICLES

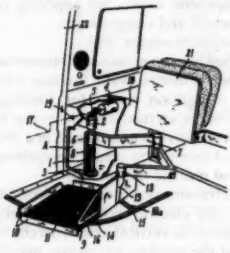
Alexandre P. L. Quercy, Boulogne, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Nov. 9, 1982, Ser. No. 440,439

Claims priority, application France, Nov. 13, 1981, 81 21351; Sep. 21, 1982, 82 15848

Int. Cl.⁴ B66B *9/20*

U.S. Cl. 414—541 **21 Claims**



1. A lift assembly for a vehicle having a vehicle floor and a vehicle body with a door opening, comprising jack means mounted within the vehicle body in vicinity of the door opening, an articulated support parallel to the vehicle floor, said articulated support comprising two bent arms pivotally mounted together and having one end and a free end, with said one end being operatively connected to said jack means and adapted to be driven thereby, said free end of the articulated support pivotally supporting a platform, curved rail means being provided in the vehicle floor for arcuately guiding the platform in the vehicle.

4,551,061

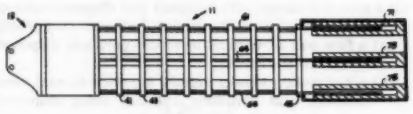
FLEXIBLE, EXTENSIBLE ROBOT ARM

Ralph W. Olenick, 7948 McClellan Rd. #4, Cupertino, Calif. 95014

Filed Apr. 18, 1983, Ser. No. 485,654

Int. Cl.⁴ B66C *1/10*

U.S. Cl. 414—735 **2 Claims**



1. A flexible robot arm comprising,

a tubular sleeve having an elongated dimension,

a plurality of spaced, generally parallel ribs within said sleeve providing support therefor transverse to said elongated dimension, said ribs having at least two apertures defined in each rib, said apertures being linearly aligned from rib to rib, forming passageways through the sleeve,

an elastomeric tube extending the length of the sleeve seated in each passageway, said tube having a fluid inflow and outflow port,

fluid supply means for supplying varying amounts of fluid to each tube, and

a plurality of flexible rods are disposed through said ribs, parallel to said tubes, said flexible rods being anchored at one end and connected to a transducer at another end, said transducer adapted to convert rod displacement due to flexing or extension into an electrical signal corresponding to said displacement.

4,551,062

DEVICE FOR PASSING A FLUID FLOW THROUGH A BARRIER

Alan P. Geary, Bristol, England, assignor to Rolls-Royce Limited, London, England

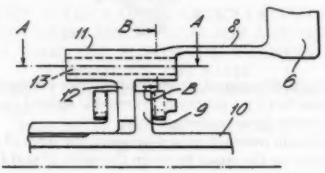
Continuation of Ser. No. 486,078, Apr. 18, 1983, Pat. No. 4,469,470. This application Aug. 31, 1984, Ser. No. 646,298

Claims priority, application United Kingdom, Apr. 21, 1982, 8211492

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.⁴ F01D *5/08, 5/18*

U.S. Cl. 415—115 **9 Claims**



1. A device for allowing passage of a fluid flow through a barrier in a turbine engine where there is relative rotation between the barrier and the fluid flow, comprising

a receiver connected to the barrier in the turbine engine and having an annular cross section about a longitudinal axis and having a plurality of circumferentially spaced slots passing therethrough,

each slot having an opening at each opposite axial end of said slot and having a helical longitudinal axis which is inclined relative to the longitudinal axis of the receiver at an angle substantially equal to an angle of a relative approach velocity vector of the fluid approaching the receiver.

4,551,063

MEDIUM-PRESSURE STEAM TURBINE

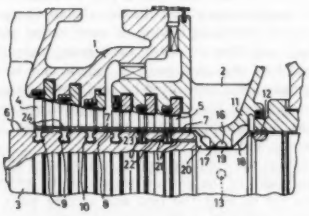
Klaus Raschke, and Gerhard Exner, both of Berlin, Fed. Rep. of Germany, assignors to Kraftwerke Union AG, Mulheim am Rhein, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,262

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3310396

Int. Cl.⁴ F01D *5/18*

U.S. Cl. 415—115 **6 Claims**



1. In a medium-pressure steam turbine of the single-flow type for use in a high-temperature steam turbine installation having a reheater and vapor transport means for feeding cooling steam to said medium-pressure steam turbine, said medium-pressure steam turbine having an output end and an input end,

an inflow part with a housing and a flow wall, a multiplicity of rotor blades arranged in a plurality of rows, a multiplicity of guide vanes arranged in rows alternating in an axial direction with said rows of rotor blades, a rotor with an outer surface, a baffle extending radially above said rotor and defining with said outer surface thereof a first annular space, said guide vanes being provided with shaft seals in the form of axial extensions juxtaposed to said outer surface of said rotor and defining therewith respective second annular spaces, said rotor blades having bases and said rotor having recesses, said bases being inserted in said recesses, said baffle extending from a stuffing gland on one side to the shaft seal of a first row of said guide vanes on the other side, the rotor blades in at least a plurality of consecutive rows at said input end of said medium-pressure turbine being provided with axial canals disposed above said outer surface of said rotor for interconnecting consecutive ones of said second annular spaces, the improvement wherein:

(a) the flow wall of the inflow part extends to the shaft seal of the first row of guide vanes at the input end of the turbine;

(b) said flow wall has an inner surface facing the outer surface of the rotor and carrying the baffle;

(c) said rotor has a plurality of axial cooling ducts extending from the first annular space to recesses containing the bases of rotor blades in at least the first row of rotor blades at said input end of the turbine; and

(d) the bases of the rotor blades in at least said first row of rotor blades are formed with radial connecting canals communicating with the axial canals of the respective rotor blades.

4,551,064

TURBINE SHROUD AND TURBINE SHROUD ASSEMBLY

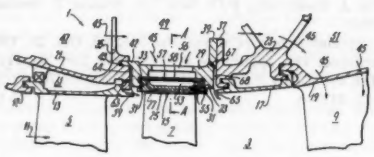
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Continuation of Ser. No. 464,145, Feb. 7, 1983, abandoned. This application May 24, 1985, Ser. No. 737,900

Claims priority, application United Kingdom, Mar. 5, 1982, 8206620

Int. Cl.⁴ F02C *7/18*

U.S. Cl. 415—116 **9 Claims**



1. A turbine shroud assembly for a gas turbine rotor stage, comprising

a shroud ring comprising a plurality of shroud segments consisting of a metallic alloy,

supporting structure circumferentially surrounding said shroud ring and to which said shroud segments are retained, at least said supporting structure consisting of a metallic alloy which retains its high strength at elevated temperatures, the supporting structure having a high strength at its normal operating temperature and the shroud segments having a substantially lower strength than the supporting structure at their normal operating temperature,

retaining means provided on said supporting structure and said shroud segments for retaining said shroud segments to said supporting structure,

means defining shroud chamber means between said shroud segments and said supporting structure,

means for supplying cooling air to pressurise said shroud chamber means, and

means for exhausting said cooling air from said shroud chamber means to a location downstream of said rotor stage;

said means for supplying cooling air to said shroud chamber means being adapted for metering said cooling air during operation of said turbine such that the total pressure forces acting outwardly on said shroud segments due to turbine gas pressure are substantially greater than the total pressure forces acting inwardly on said shroud segments due to cooling air pressure in said shroud chamber means, said shroud segments thereby experiencing an outward thrust, said shroud segments having means defining a plurality of load paths in addition to said retaining means distributed over said shroud segments so as to transfer said outward thrust to said supporting structure without overstressing said shroud segments.

4,551,065

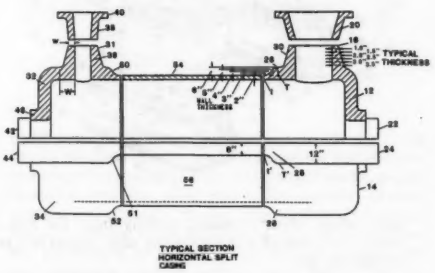
COMPOSITE HORIZONTALLY OR VERTICALLY SPLIT CASING WITH VARIABLE CASING ENDS

John H. Becker, 500 Meilleur St., Sherbrooke, Quebec J1H 3X4, Canada

Filed Dec. 13, 1982, Ser. No. 449,505

Int. Cl.⁴ F01D *25/24*

U.S. Cl. 415—219 R **3 Claims**



1. A method of fabricating a casing which comprises:

forming an inlet section and an outlet section, each section having a one end and another end, the other end of one of the sections having an extension which diminishes from a maximum thickness T to a minimum thickness t, the extension when viewed in section being a trapezoidal-like section;

forming a shell section having outwardly facing surfaces of a given thickness;

trimming back the extension of the outer end of the one section until the extension terminates in an inwardly facing flat surface which is equal in thickness to the thickness to the inwardly facing surface of the shell section;

abutting the outwardly facing surfaces;

welding said surfaces together; and

joining the other of said sections to the shell casing to form a composite casing.

4,551,066

SUBMERGED WATER WHEEL

James O. Frisz, 921 Pear St., Brea, Calif. 92621

Filed Mar. 7, 1983, Ser. No. 473,001

Int. Cl.⁴ F03D *7/06*; F03B *7/00*

U.S. Cl. 416—119 **1 Claim**

1. Turbine apparatus within a large moving stream of water such as an ocean current for extracting energy from the moving stream, comprising:

a rotating frame member including a ballast chamber;

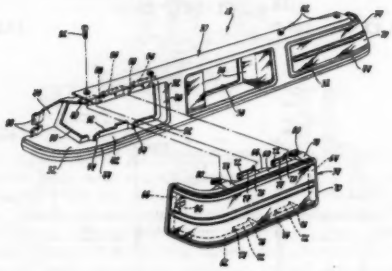
means supporting the rotating frame member for rotation about an axis;

a plurality of vanes with included ballast chambers;

means rotatably mounting the vanes on the frames at angularly spaced intervals around the axis of rotation of the frame member, each vane rotating about an axis parallel to the axis of rotation of the frame member with said vanes being laterally supported along their full respective axes of rotation;

each vane further having elongated closely spaced major outer surfaces extending parallel to and lengthwise of the axis of rotation of the vane, the major surfaces of each vane being curved slightly and intersecting in leading and trailing edges that are parallel to the axis of rotation of the vanes, said vanes also having a cross-sectional foil shape with the maximum width being closer to said leading edge, with the axis of rotation of each vane being positioned at the widest part of the foil and at a point approximately one-third from the leading edge of the vane to its trailing edge;

stop means limiting the rotation of the respective vanes between first and second angular positions, the vanes in the first position having the plane defined by the leading



and trailing edges extending radially from the axis of rotation of the shaft with the trailing edge nearest said axis of rotation; and

means controlling the rate of rotation of the vanes about their own axis of rotation in the one direction going from the second position to the first position, said means controlling the rate of rotation including a piston and cylinder connected between each vane and the frame member, the movement of the piston in the cylinder displacing a fluid to restrict the movement of the piston, said controlling means including means for adjusting the rate of rotation in said one direction to approximately half the rate of rotation of the rotating frame member, whereby each vane rotates the 135 degrees between the second position and first position about its axis of rotation in the same time that the frame member rotates through 270 degrees;

said means for adjusting the rate of rotation of the vanes including a flow meter for sensing changes in the velocity of the stream, means for rotating the flow meter with changes in direction of the stream of water, and means responsive to the flow meter for adjusting the restriction to fluid flow out of the cylinder by the piston.

4,551,067

HELICOPTER ROTOR

Vittorio Caramaschi, Gallarate, and Pier Luigi Castelli, Busto Arsizio, both of Italy, assignors to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed Mar. 2, 1983, Ser. No. 471,342

Claims priority, application Italy, Mar. 11, 1982, 67304 A/82

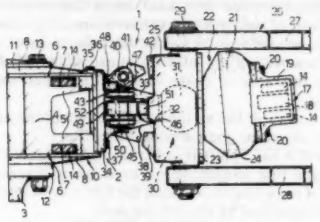
Int. Cl.[4] **B64C** *27/38*

U.S. Cl. 416—140 **7 Claims**

1. A helicopter rotor including a central hub rotatable about its axis having a plurality of blades affixed thereto, the blades extending radially outwardly of the hub, a coupling means which connects the blades to the hub and permits the blades to oscillate with respect to the hub in a plane perpendicular to said axis wherein each blade further comprises:

a surface (**52**) positioned substantially perpendicular to said plane and rigidly connected to the blade for limiting oscillations of the blade in said plane;

an abutment means (**46**) supported by the hub (**2**) and cooperating with the surface (**52**) to limit oscillation in said plane within variable limits in a predetermined range as a direct function of the angular velocity of the hub (**2**) itself wherein the abutment means (**46**) is movable with respect to the hub (**2**) in said plane by the effect of centrifugal



force wherein the abutment means further comprises two rockers rotatably mounted about axes which are substantially parallel to the axis of rotation of the hub (**2**), the rockers rotatable between a first position in which one of the arms (**51**) of each said rocker (**46**) is disposed facing surface (**52**) at a predetermined distance therefrom, and a second position in which said arm is rotated so that it is no longer facing surface (**52**) and is outside the path followed by surface (**52**);

a resilient means (**50**) which is in elastic communication with the abutment means (**46**) and which acts on the abutment means in a direction against the direction of centrifugal force.

4,551,068

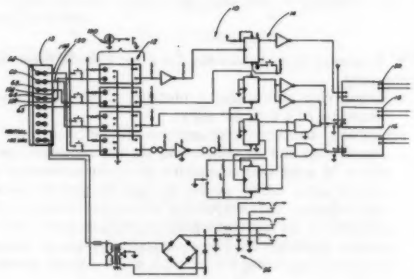
DUPLEX PUMP CONTROLLER

Ronald J. Boudreaux, P.O. Box 722, Station 2, Houma, La. 70360

Continuation-in-part of Ser. No. 316,503, Oct. 29, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 517,186

Int. Cl.[4] **G08B** *19/00;* **E03F** *7/00;* **F04B** *49/10, 49/06*

U.S. Cl. 417—8 **16 Claims**



1. A duplex pump controller adapted for use in wet wells having a flammable gas environment, comprising:

a. means responsive to varying fluid levels within said well for providing signals in response thereto;

b. a terminal block connected to said means for providing a barrier between said response means and said controller;

c. a plurality of optically coupled interface units connected

to said terminal block for providing spark free intercoupling to said controller;

d. precise current limiting means connected in series to each of said interface units for providing safe current levels thereto;

e. a power source connected to said current limiting means for providing power to said controller and said current limiting means; and

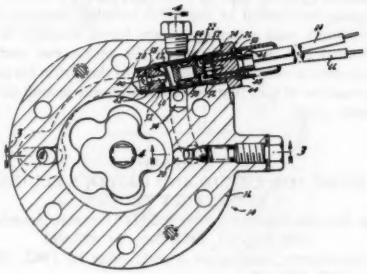
f. solid state relay latching means and logic control circuitry connected to said interface units for activating said pump controller.

4,551,069

INTEGRAL OIL PRESSURE SENSOR

Mark R. Gilmore, Troy, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Mar. 14, 1984, Ser. No. 589,325
Int. Cl.[4] F04B *49/02, 49/10, 49/06*
U.S. Cl. 417—13 **4 Claims**



1. A pressure lubrication system for a refrigeration compressor comprising:

a compressor housing;

compressor means within said housing;

motor means within said housing and drivingly connected to said compressor means;

lubricant pump means drivenly connected to said motor means, said pump means being operative to supply lubricant to said compressor means and including a housing having an inlet and an outlet, said inlet communicating with a fluid reservoir which is subject to wide pressure differentials; and

self-contained sensor means removably positioned within said pump housing and passage means within said pump housing for placing said sensor means in communication with said inlet and said outlet, said sensor means being operative to de-energize said motor in response to a sensed differential condition between said inlet and outlet outside of a predetermined range.

4,551,070

NOISE CONTROL FOR CONICALLY PORTED LIQUID RING PUMPS

Ole B. Olsen, Newtown; Charles W. Bilik, Norwalk; Herbert H. Johnson, Georgetown, and Charles M. Jozepaitis, Bridgeport, all of Conn., assignors to The Nash Engineering Company, Norwalk, Conn.

Continuation-in-part of Ser. No. 564,881, Dec. 23, 1983,. This application Dec. 21, 1984, Ser. No. 685,236
Int. Cl.[4] F04C *19/00*
U.S. Cl. 417—68 **5 Claims**

1. A liquid ring pump comprising:

an annular housing;

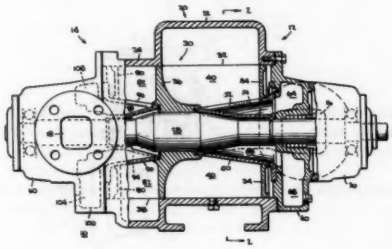
a rotor rotatably mounted in the housing and having a frusto-conical bore concentric with the rotor axis;

a frusto-conical port member disposed in the bore and fixedly mounted relative to the housing, the port member including (1) a gas intake port, (2) a first gas discharge port located beyond the intake port in the direction of rotor rotation and having a closing edge including a segment which is inclined in the direction of rotor rotation from a first relatively large diameter circumference portion of the port member to a second relatively small diameter circumference portion of the port member, the first and second circumference portions being axially spaced from one another along the rotor axis, and (3) a second gas discharge port spaced from the first discharge port and located beyond the inclined closing edge segment but before the intake port in the direction of rotor rotation, the second gas discharge port including a plurality of apertures spaced from one another along at least a major portion of the length of the inclined closing edge segment.

5. A liquid ring pump comprising:

an annular housing;

a rotor rotatably mounted in the housing and having a frusto-conical bore concentric with the rotor axis;



a frusto-conical port member disposed in the bore and fixedly mounted relative to the housing, the port member including (1) a gas intake port, (2) a first gas discharge port located beyond the intake port in the direction of rotor rotation and having a closing edge including a segment which is inclined in the direction of rotor rotation from a first relatively large diameter circumference portion of the port member to a second relatively small diameter circumference portion of the port member, the first and second circumference portions being axially spaced from one another along the rotor axis, and (3) a second gas discharge port spaced from the first discharge port and located beyond the inclined closing edge segment but before the intake port in the direction of rotor rotation, the second gas discharge port having (a) an opening edge which is substantially parallel to the inclined closing edge segment, and (b) a closing edge having (i) a mid-portion spaced from the opening edge, and (ii) end portions on each side of the mid-portion which are inclined toward respective opposite ends of the opening edge.

4,551,071

DIAPHRAGM-TYPE FUEL PUMP

Kichio Ohgaki, and Kazuhiro Ohshima, both of Ibaragi, Japan, assignors to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,459
Claims priority, application Japan, Jun. 2, 1983, 58-96975; Jun. 2, 1983, 58-96977; Jun. 2, 1983. 58-96979; Jun. 2, 1983, 58-96980
Int. Cl.[4] F04B *39/16, 39/14, 43/14*
U.S. Cl. 417—313 **8 Claims**

1. A diaphragm-type fuel pump, comprising:

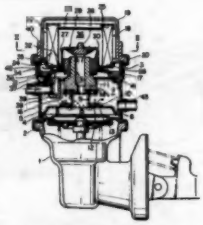
an outer chamber housing made of a metal plate and having therein a fuel outlet chamber, a pump chamber, and pump means for pumping fuel from said pump chamber into said fuel outlet chamber, said pump means including a reciprocally movably diaphragm, said outer chamber housing having an upper wall and a side wall;

a fuel filter unit supported on an upper surface of said upper wall and said outer chamber housing and means for detachably securing said fuel filter unit to said outer cham-

ber housing, said fuel filter unit having a fuel inlet chamber therein, a filter disposed in said fuel inlet chamber, and substantially centrally located fuel inlet valve means for allowing fuel to pass through said filter, said inlet valve means including a valve member made of rubber;

a connector disposed in said outer chamber housing, having an end attached to said upper wall thereof, and having a hole therein which communicates with an opening provided through said upper wall of said outer chamber housing;

a fuel inlet pipe extending from said connector through said side wall of said outer chamber housing and having a passageway therein which communicates with said hole in said connector; wherein said fuel filter unit includes a lower casing having an annular drain groove along an outer peripheral edge thereof and having a plurality of ports therethrough, fuel from said inlet pipe flowing through said connector, through said opening in said upper wall, through said ports in said lower casing, into said fuel inlet chamber, and through said filter in said fuel



inlet chamber, said ports in said lower casing being located vertically higher than said annular drain groove; and wherein said means for detachably securing said filter unit to said outer chamber housing includes a nut fixedly and substantially centrally supported on said fuel filter unit and a bolt supported on said outer chamber housing and extending substantially centrally through said upper wall thereof, said nut being threaded over said bolt, said bolt extending into said fuel filter unit, and said bolt having a hole therethrough which provides fluid communication between said fuel inlet chamber and said pump chamber; and

a substantially tubular fuel holder fixed to said outer chamber housing and projecting upwardly past said upper wall thereof, said upper wall of said outer chamber housing and said fuel holder together defining a substantially cup-shaped fuel reservoir below said fuel filter unit, said cup-shaped fuel reservoir receiving fuel which drops from said fuel filter unit when said fuel filter unit is detachable from said outer chamber housing.

4,551,072

FLUID PRESSURE OPERATED ACTUATOR

Heinz Barall, Don Mills, Canada, assignor to Hibar Systems Limited, Thornhill, Canada

Filed Feb. 15, 1984, Ser. No. 580,498

Int. Cl.[4] F04B *21/02*

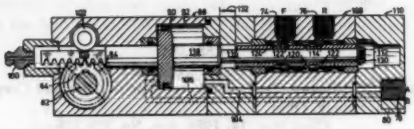
U.S. Cl. 417—318 **7 Claims**

2. A fluid pressure operated actuator for cyclically actuating first and second devices in synchronism, comprising:

a piston/cylinder unit including a piston carried by a piston rod and reciprocable in a cylinder under the effect of pressure from a fluid pressure source;

means for coupling the piston rod to said first device so that said device is actuated at each cycle of the piston;

valve means for controlling supply of a pressurized fluid to said second device in synchronism with and after the first said device at each said cycle, independent of the supply of pressurized fluid to the piston/cylinder unit, said valve means comprising: a housing having a pressure port adapted to be coupled to a fluid pressure source, an exhaust port, and at least one fluid transfer port adapted to be coupled to said second device; a valve member in said housing, said valve member defining fluid passageways for providing communication between said ports and being movable in said housing between two spaced positions in one of which said pressure port communicates with said fluid transfer port, and in the other of which said



fluid transfer port communicates said exhaust port; and means coupling said valve member and said piston of the piston/cylinder unit so that reciprocation of the piston causes movement of the valve member between its said positions; said coupling means being adapted to allow limited lost motion between the piston rod and valve member at each end of the stroke of the piston for assuring actuation of said first device before said second device at each cycle.

4,551,073

PUMP FOR LIQUID AND GASEOUS FLUIDS, ESPECIALLY BLOOD

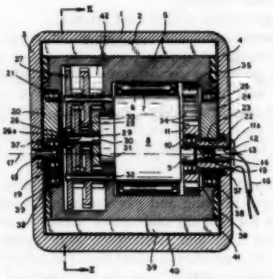
Walter Schwab, Kahlsperg 694, A-5411 Oberalm, Austria

Filed May 11, 1983, Ser. No. 493,693

Claims priority, application Austria, May 12, 1982, 1857/82; Sep. 9, 1982, 3364/82

Int. Cl.[4] F04B *35/04;* **F04C** *1/02*

U.S. Cl. 417—352 **20 Claims**



1. A pump for gas or liquid fluids, especially blood, comprising:

a housing having a peripheral wall formed with a trochoidal surface having at least one lobe;

a rotor formed as a rotary piston body in said housing having at least two edges defining respective seals with said surface;

an eccentric in said rotor and rotatable relative thereto define a trochoidal movement for said rotor edges along said surface whereby said fluid is displaced by said rotor;

an inlet port and an outlet port formed in said housing for delivering said fluid to and discharging said fluid from said housing; and

drive means including an electric motor disposed within said rotor and planetary gear transmission means operatively connected to said rotor and to said motor whereby said rotor is driven to cause said trochoidal movement of said edges along said surface and eccentric rotation of said

rotor in said housing, said drive means having an eccentric shaft extending toward a lateral wall of said housing, and journaled for rotation relative thereto, said eccentric shaft being offset from a shaft of said motor, and defining an eccentric axis for said rotor at said lateral wall of said housing, and rotating contact means cooperating with said eccentric shaft at said lateral wall for energizing said electric motor.

4,551,074

AIR PUMP APPARATUS

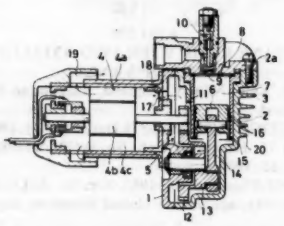
Urataro Asaka, Kamifukuoka; Shigeo Kanai, Miyazaki; Yasuhiro Tanaka, Miyazaki, and Kazuya Iwamoto, Miyazaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Honda Rokku, Kiyazaki, both of, Japan

Filed Sep. 30, 1982, Ser. No. 428,795

Claims priority, application Japan, Oct. 1, 1981, 56-154745; Oct. 1, 1981, 56-154746; Oct. 1, 1981, 56-144981; Oct. 1, 1981, 56-144982[U]

Int. Cl.[4] F04B *35/04;* F01B *31/10*

U.S. Cl. 417—366 **6 Claims**



1. An air pump apparatus having a cylinder means extending from a pump casing, said cylinder means comprising a cylinder liner positioned within the walls of the cylinder means and having a front portion, a piston having a front and being mounted for reciprocating movement within said cylinder liner, a pump chamber being formed between the front of the piston and the front portion of the cylinder liner, an annular gap formed between said piston and an inner wall of said cylinder liner; said piston having a plurality of annular grooves formed on an outer circumferencial surface thereof, the annular gap and annular grooves forming a labyrinth path extending from said pump chamber; to the interior of the pump casing and said pump casing being provided with an air discharge opening for discharging air in the casing to the exterior.

4,551,075

WELL PUMP

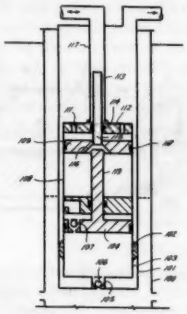
Carlos R. Canalizo, 10511 Allegheny Dr., Dallas, Tex. 75229

Continuation-in-part of Ser. No. 317,449, Nov. 2, 1981, abandoned. This application Apr. 21, 1983, Ser. No. 487,005

Int. Cl.[4] F04B *47/08*

U.S. Cl. 417—383 **5 Claims**

1. A hydraulic pump comprising,
a body,
a power cylinder in said body,
a power piston in said power cylinder,
a production cylinder in said body,
a production piston in said production cylinder,
a connecting rod rigidly interconnecting said pistons,
a production fluid inlet to the head end of the production cylinder,
a standing valve in said production fluid inlet,
a traveling valve in said production piston,
a power fluid inlet to the rod end of said power cylinder,
a production fluid outlet in the body connected to the head end of the power cylinder and to the rod end of the production cylinder,
seal means about the exterior of the body, and support means on the body:
in combination with;
a landing nipple having support means for engagement with said pump support means and supporting said pump,



a polish bore section for receiving said seal means, and
a by-pass passageway extending from a point above the pump to a first point to provide fluid communication with the rod end of the production cylinder,
said nipple having a port establishing fluid communication with the rod end of the power cylinder.

4,551,076

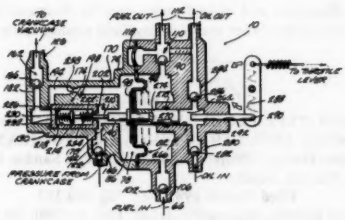
FLUID DRIVEN PUMP WITH ONE-WAY VALVE IN FLUID INLET

Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 7, 1983, Ser. No. 540,045

Int. Cl.[4] F02B *33/06*

U.S. Cl. 417—395 **21 Claims**

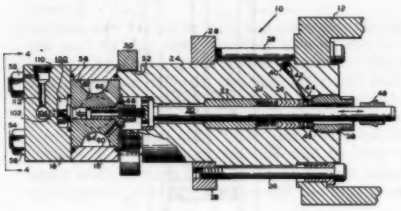


1. A fluid driven pump comprising a pump housing defining a recess including therein a moveable wall which divides said recess into a variable volume driving chamber and a variable volume pumping chamber, a pressure inlet communicable with said driving chamber and adapted to communicate with a source of pressure which oscillates between an operating pressure and a pressure different from the operating pressure, said pressure inlet including one-way valve means for permitting fluid under the operating pressure to communicate with said driving chamber and thereby to move said moveable wall in one direction when said driving chamber is in communication with said pressure inlet, a vent communicable with said driving chamber and adapted to be in communication with a source of pressure different from said operating pressure, a spring in said pumping chamber and extending between said moveable wall and said pump housing, and means for selectively controlling communication of said driving chamber with said pressure inlet and said vent.

4,551,077
HIGH PRESSURE PUMP

Amos Pacht, Houston, Tex., assignor to Butterworth Inc., Florham Park, N.J.

Filed Mar. 22, 1984, Ser. No. 592,395
Int. Cl.⁴ F04B *21/02, 21/08;* **F16J** *15/18*
U.S. Cl. 417—454 **14 Claims**



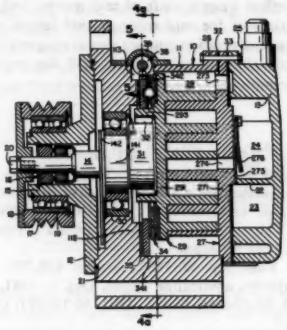
1. In a high pressure in-line valve liquid reciprocating pump including a pump drive housing and a reciprocating plunger, the improvement comprising, a cylinder and stuffing box means surrounding said plunger, first independent securing means fixedly attaching a first end of said cylinder and stuffing box means to said drive housing, said cylinder and stuffing box means having a second end including a threaded portion about the outer end periphery thereof, mounting adapter ring means threadably secured to said threaded portion, suction manifold means having a first face in contact with said second end and a second face in a plane parallel to said first face, discharge manifold means in contact with said second face; suction and discharge valve assembly means disposed within an interior cavity of said suction manifold means and including a suction valve adjacent said second end and axially aligned with the axis of said plunger and a discharge valve adjacent said discharge manifold means and axially aligned with the axis of said plunger, and second independent securing means fixedly attaching said suction and discharge manifold means and valve assembly means as a unit to said mounting adapter ring means, whereby either the manifold end of said pump or the cylinder and stuffing box end of said pump may be disassembled independently of the other end for easy field maintenance thereof.

4,551,078
SCROLL-TYPE FLUID DISPLACEMENT APPARATUS WITH ANGULAR OFFSET VARYING MEANS

Masaharu Hiraga, Honjyo, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Oct. 9, 1981, Ser. No. 310,312
Claims priority, application Japan, Oct. 9, 1980, 55-141666
Int. Cl.⁴ F01C *1/04, 21/16*
U.S. Cl. 418—16 **6 Claims**

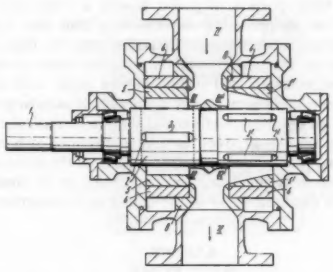
1. In a scroll type fluid displacement apparatus including a housing having a fluid inlet and a fluid outlet, a fixed scroll member fixedly disposed relative to said housing and having an end surface from which a first wrap means extends into the interior of said bushing, an orbiting scroll member having an end plate means from which a second wrap extends, said first and second wrap means interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, drive means operatively connected to said orbiting scroll member to effect orbital motion of said orbiting scroll member, and rotation preventing means for preventing rotation of said orbiting scroll member during orbital motion thereof, whereby said fluid pockets change volume by the orbital motion of said orbiting scroll member; the improvement comprising turning means operatively coupled to said orbiting scroll member through said rotation preventing means for varying the angular offset of said first and second wrap means independently of the operation of said drive means, said turning means being operable from the outside of said housing.



4,551,079
ROTARY VANE PUMP WITH TWO AXIALLY SPACED SETS OF VANES

Alexander S. Kain, Minety, England, assignor to Plenty Limited, England

PCT No. PCT/GB83/00243, § 371 Date May 15, 1984, § 102(e) Date May 15, 1984, PCT Pub. No. WO84/01408, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 28, 1983, Ser. No. 611,003
Claims priority, application United Kingdom, Sep. 28, 1982, 8227630
Int. Cl.⁴ F04C *11/00, 15/04*
U.S. Cl. 418—26 **10 Claims**



1. A sliding vane type rotary pump comprising

two sets of vanes slidably mounted to a rotor shaft, said vane sets being located at spaced longitudinal positions along the shaft's axis,

a rotor surrounding each of said vane sets, each rotor having flats on its inner surface contacted by the outer ends of the vanes associated therewith, said vanes of each set and said rotor shaft cooperating to define two sets of chambers located at spaced longitudinal positions along the shaft's axis, the inlets and outlets to one set of chambers being through one side face thereof, and the inlets and outlets to the other set of chambers being through the adjacent side face of said other set, so that the inlets and outlets of said two chamber sets face one another,

a stator within which said rotors and rotor shaft are positioned, and

a common pump inlet and a common pump outlet at least

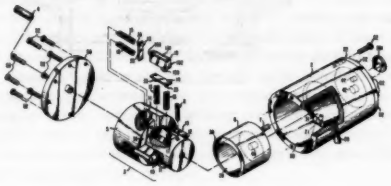
partially defined by said stator, said inlet and outlet being located between said longitudinally spaced chambers, the fluid inflow to and fluid outflow from said two chamber sets thereby being generally parallel to the shaft's axis as fluid passes through said pump from said common inlet to said common outlet.

4,551,080

VARIABLE DISPLACEMENT SLIDING VANE PUMP/HYDRAULIC MOTOR

Cletus M. Geiger, 3 E. High St., Bound Brook, N.J. 08805

Filed Oct. 19, 1983, Ser. No. 543,465
Int. Cl.[4] F04C *15/04*
U.S. Cl. 418—28 **9 Claims**



1. A variable displacement sliding vane pump/hydraulic motor comprising:

a. a housing which forms an eccentric chamber and a contiguous concentric chamber and contains a fluid inlet port and a fluid outlet port,

b. a sliding wall which sits slideably inside said eccentric chamber and which contains a rotor chamber which is concentric with said concentric chamber,

c. a rotor assembly comprising a hub which fits rotatably inside said concentric chamber and a rotor which fits rotatably inside said rotor chamber, and which contains a plurality of radial slots,

d. a shaft which is attached concentrically to said rotor assembly,

e. a plurality of sliding vanes which slideably fit into said radial slots in said rotor assembly,

f. tensioning means which impress said sliding vanes outward in radial direction,

g. lateral tensioning means which impress said sliding vanes in a direction parallel to the center line of said rotor assembly,

h. end plates which enclose the ends of said housing to prevent fluid loss therefrom, and

i. a means to slideably position said sliding wall within said eccentric chamber.

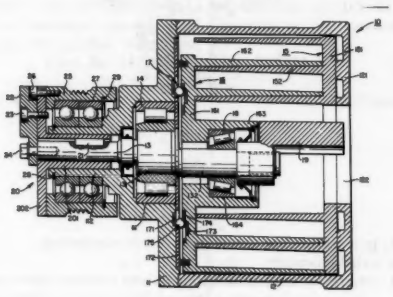
4,551,081

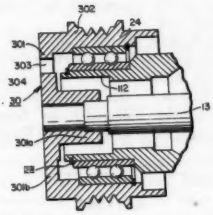
PULLEY MECHANISM FOR FLUID DISPLACEMENT APPARATUS

Tadashi Sato, Maebashi, and Masaharu Hiraga, Honjo, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 433,795, Oct. 12, 1982, abandoned.
This application Oct. 26, 1984, Ser. No. 665,087
Claims priority, application Japan, Oct. 12, 1981, 56-162212
Int. Cl.[4] F04C *18/02;* **F01C** *1/02*
U.S. Cl. 418—55 **3 Claims**

1. In an orbiting piston type fluid displacement apparatus including a housing having a front end plate, a fixed member fixedly disposed relative to said housing, an orbiting piston member disposed within said housing and interfitting with said fixed member to make a plurality of line contacts to define a sealed off fluid pocket, and a drive shaft penetrating said front end plate and being rotatably supported by said front end plate, the drive shaft being connected to said orbiting piston member to effect orbital motion of said orbiting piston member, the improvement comprising said front end plate being formed with an annular sleeve extending from a front end surface of said front end plate for surrounding said drive shaft, a first bearing carried by said front end plate for rotatably supporting said drive shaft, a rotor member including a pulley element, a tubular element and a radial flange element, and a second bearing carried on the outer surface of said sleeve and within the inner surface of said pulley element for rotatably supporting said drive shaft, said pulley element extending over and being rotatably supported by said second bearing, said tubular element being fixed on the outer end of said drive shaft, and said radial flange element radially projecting from an axial end of said tubular element and connected to said pulley element at its outer peripheral end surface, said rotor member being held in axial position by a first snap ring connected to an outer





surface of said sleeve, a second snap ring connected to an inner surface of said pulley element, a first shoulder formed on the outer surface of said sleeve, and a second shoulder formed on the inner surface of said pulley element, said pulley, tubular and radial flange elements of said rotor member being formed integral with one another, and combined unbalance and access means for both unbalancing said rotor member and for providing access through said rotor member to one of said snap rings to accomplish the fitting operation of said last-mentioned snap ring, said combined unbalance and access means being an arc shaped hole formed completely through said radial flange element into the area between the outer surface of said sleeve and the inner surface of said pulley element, and extending over only a portion of said radial flange element to make said rotor member unbalanced.

4,551,082

BEARING DEVICE OF SEALED TYPE SCROLL COMPRESSOR

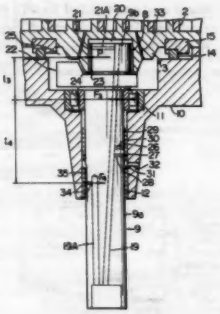
Eiichi Hazaki, Ibaraki; Hiroaki Kuno, Shimizu; Naoshi Uchikawa, Shimizu; Takahiro Tamura, Shimizu; Akira Murayama, Shimizu, and Takao Mizuno, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,040

Claims priority, application Japan, Dec. 22, 1982, 57-223770

Int. Cl.[4] F04C *18/04, 29/02*

U.S. Cl. 418—55 **7 Claims**



1. In a sealed type scroll compressor comprising:

a sealed chamber;

a compressor section including a fixed scroll member and an orbiting scroll member located in an upper portion of said sealed chamber;

an electric motor section located in a lower portion of said sealed chamber;

a crankshaft including a crank section connected to said orbiting scroll member and a shaft section supported by a frame; and

an intermediate pressure chamber defined between the orbiting scroll member and the frame and having a pressure intermediate a discharge pressure and a suction pressure;

a bearing device comprising:

a roller bearing located on the frame in a position close to the crank section of the crankshaft for supporting the shaft section thereof; and

a plain bearing located on the frame in a position remote from the crank section for supporting the shaft section and wherein an oil feeding section is provided on the frame between the ball-and-roller bearing and the plain bearing for feeding to the ball-and-roller bearing oil drawn through an eccentric feed oil passage formed in the crankshaft.

4,551,083

DUAL ROTOR GEAR ASSEMBLY FOR TROCHOIDAL ROTARY DEVICE

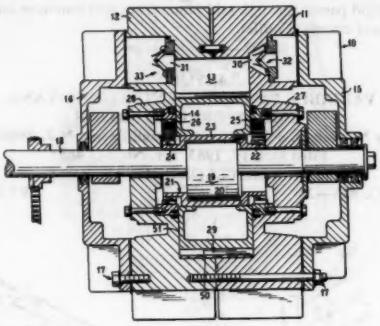
Ralph M. Hoffmann, Eden Prairie, Minn., assignor to Trochoid Power Corporation, Eden Prairie, Minn.

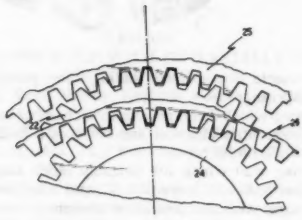
Filed May 21, 1984, Ser. No. 612,419

Int. Cl.[4] F01C *1/22, 17/02*

U.S. Cl. 418—61 A **8 Claims**

1. A trochoidal rotary device comprising a rotor disposed for planetating movement on a shaft, said rotor having a symmetrical peripheral profile surface, a housing having a peripheral wall surface defining a cavity for containing said rotor, an eccentric mounted on said shaft and supporting said rotor for movement in said cavity on said shaft, and working chambers defined in said cavity between said rotor peripheral profile surface and said housing peripheral wall surface, the improvement comprising that the rotor movement is substantially free of lateral wobble in that said rotor is disposed for movement in said cavity on said shaft by a like pair of timing gear systems engaged with said rotor and disposed on opposed lateral sides of said rotor, each said timing gear system comprising a pinion gear and a ring gear, said pair of timing gear systems being





equally loaded at all times during movement of said rotor and circumferentially offset relative to one another so as to not be in radial alignment with one another.

4,551,084

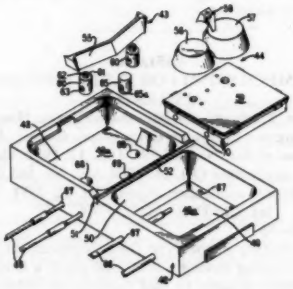
CONVERTIBLE MOLD

Connie Lake, Tinley Park, Ill., assignor to Creative Industries, Inc., Bridgeview, Ill.

Filed May 25, 1983, Ser. No. 497,843

Int. Cl.[4] B29C *1/00*

U.S. Cl. 425—185 **19 Claims**



1. A plastic molding apparatus for forming three dimensional containers from a single sheet of synthetic plastic material, each container comprising side-by-side generally dish-shaped container members which are hinged together, said dish-shaped members having different interior configurations with respect to one another, and which apparatus comprises op-

posed relatively movable base means, opposed relatively movable pairs of male and female mold members carried by said base means, at least one of said male and female mold members of each pair of said male and female mold members having peripheral product forming surfaces defining the outer boundaries of a container to be molded by said pair of said male and female mold members, a first plurality of different inserts having different projecting configurations for selective attachment to a first member of each of said pair of male and female mold members, a second plurality of different inserts having different projection configurations for selective attachment to a second member of each of said pair of mold members having surfaces complimentary to the first plurality of inserts to establish a male/female mold relationship between said first and second plurality of inserts, quick change means for individually detachably securing the plurality of first and second inserts to an associated mold member and thus enabling the molds to produce containers having selected variable predetermined physical characteristics determined by said plurality of inserts without change of said first and second members or said base means, means on said male and female mold members for producing a hinge between the dish-shaped members, said quick change means comprising locking rod means carried by said mold members, said inserts having opening means cooperating with said rod means for locking said inserts into assembly with said associated mold member.

4,551,085

COMPRESSION MOLDING APPARATUS HAVING VACUUM CHAMBER

Joseph N. Epel, Southfield, and Robert E. Wilkinson, Birmingham, both of Mich., assignors to The Budd Company, Troy, Mich.

Continuation of Ser. No. 488,494, Apr. 28, 1983, Pat. No. 4,488,862. This application Dec. 14, 1984, Ser. No. 681,567
Int. Cl.[4] B29G *1/00*
U.S. Cl. 425—405 R **8 Claims**

1. Apparatus for compression molding a part from a charge having a curable resin therein, said apparatus comprising:

upper and lower die members defining a mold cavity therebetween generally corresponding to the shape of the desired part when the dies are closed;

means for moving the die members relative to each other, said means being operative to move the die member to an open position where the die members are spaced apart of sufficient distance to permit the charge to be placed on the lower mold, said means being further operative to move the die members to a partially closed position where the mold cavity is essentially defined but the upper die remains spaced from the charge, and said means being subsequently operative to move the die members to a fully closed position where the upper die member contacts the charge;

a fixed member providing a first horizontally extending surface surrounding the lower die and connected thereto in a fluid-tight manner;

a vertically movable ring member surrounding, yet spaced from, the upper die, which provides a second horizontal surface substantially aligned with the firs horizontal surface;

means independent from said means for moving, for moving said ring relative to said die members;

sealing means extending between the ring and upper die providing a seal therebetween while permitting relative movement therebetween;

said first and second surfaces being arranged so as to cooperate to provide an air seal therebetween when the die members are moved to the partially closed position thereby defining a sealed vacuum chamber surrounding the mold cavity;

vacuum means for evacuating the sealed chamber; and

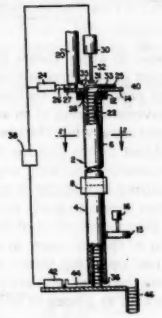
said means for moving the die members being operable to move the upper die to the fully closed position after the vacuum chamber has been evacuated whereby the resin in the mold cavity can cure to form the finished part.

4,551,086

DEVICE FOR CENTRIFUGALLY CASTING ARTICLES

David L. Rawlings, Bayville, N.Y., assignor to International Hydron Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,814
Int. Cl.[4] B29D *11/00*
U.S. Cl. 425—425 **15 Claims**



1. An improvement in a device for the centrifugal casting symmetrical or asymmetrical contact lenses said device having a rotatable polymerization column adapted for accommodating a plurality of molds within said polymerization column; advancing means for positioning a mold containing a polymerizable or curable composition into alignment with the inlet end of said polymerization column; displacement means for feeding said advanced mold into said inlet end of said polymerization column; and control and motor means for operating said advancing means and displacement means and for rotating said column, the improvement wherein said advancing means include pusher means for advancing said mold into alignment with the inlet end of said column, said pusher means being adapted to accommodate a portion of said mold, and jaw means cooperating with said pusher means to envelope said mold in a manner such as to prevent horizontal angular displacement of said mold when said mold is in alignment with said inlet end and wherein said displacement means for feeding said advanced mold into said inlet includes an end portion adapted to be inserted into sad mold for directing said mold into said inlet portion of said column.

4,551,087

EXTRUSION APPARATUS

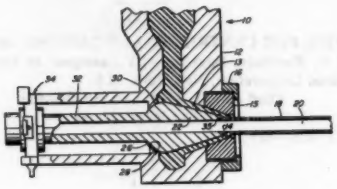
Ali Pan, Storrington Township, and Karl S. Cohrs, Kingston, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 11, 1984, Ser. No. 619,043
Int. Cl.[4] B29F *3/04*
U.S. Cl. 425—466 **16 Claims**

1. Extrusion apparatus comprising an extrusion head having

a passage for material to be extruded, an extrusion die and a die insert which between them define a die orifice of endless form, the die insert extending upstream along a die passage from the die orifice, mounted in the head in a universal mounting and having a portion extending from the head in the direction opposite to the die orifice, and means to effect arcs of movement of the die insert about its mounting along two different and crossing paths and, in respect of movement along each path;

said means comprises two opposing thrust means spaced-apart one at each side of said insert portion, the thrust means operable interconnected to be movable together alternatively in one directional sense or in the opposite directional sense and operable, one by movement in each



directional sense, to apply thrust to cause movement of the insert portion in one direction or the other along said path, the thrust produced by each thrust means during its operational movement being at an angle to the movement in the directional sense while the operable interconnection between the thrust means ensures that the insert portion maintains continuous operable engagement with both thrust means during movement in either directional sense to enable a thrust means to apply thrust immediately upon change in the directional sense of movement; and

during movement of the die insert in either direction along one path, the two opposing thrust means associated with movement along the other path are operably connected to the die insert to act as guides to hold it on said one path.

4,551,088

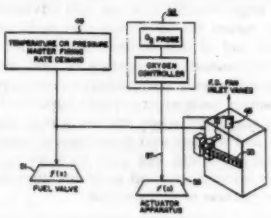
COMBUSTION CONTROL SYSTEM

Donald M. Stough, Jackson, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 392,978, Jun. 28, 1982, Pat. No. 4,479,774. This application Aug. 22, 1984, Ser. No. 643,126

Int. Cl.⁴ F23N *5/00*

U.S. Cl. 431—76 **9 Claims**



1. A combustion control system for a combustion apparatus supplied with fuel which is mixed with an intake of a combustive agent, including oxygen, said combustion apparatus being a two point parallel positioning system in which the amount of fuel supplied is directly controlled by a master positioner and the amount of combustive agent supplied is controlled by a master controller which actuates a master member movably mounted about a first axis, a slave member movably mounted about a second axis for regulating the amount of combustive agent intake and an intermediate linkage strut having a fixed longitudinal dimension connected between said master member and said slave member for establishing a masterslave relationship for travel through relative predetermined arcs of travel which provides a fixed combustive agent to fuel ratio, said combustion control system comprising:

a linkage strut adjustor apparatus, longitundinally expandable and contractable, in mechanical communication with said intermediate linkage strut to modify the longitudinal dimension thereof such that said master-slave relationship is a function of said adjustor apparatus;

actuator means for effecting said longitudinal expansion and contraction of said linkage strut adjustor apparatus, remotely disposed relative to said linkage strut adjustor apparatus and in mechanical communication therewith, wherein the actuator means is in mechanical communication with the adjustor apparatus by means of a cable means whereby said remotely disposed actuator means effects the modification of the longitudinal dimension of the adjustor apparatus by said cable means.

4,551,089

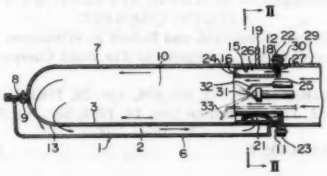
EVAPORATION BURNER

Kingo Miyahara, Tokyo, Japan, assignor to Dowa Company, Ltd., Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,582

Int. Cl.⁴ F23D *11/44*

U.S. Cl. 431—116 **2 Claims**



1. An evaporation burner comprising a burning unit having a hollow gas chamber therein and burning plates on its surface, a gas generating chamber through which a preheat burning flame may flow, said gas generating chamber being located adjacent to said burning unit and substantially along the centerline of said burning unit, an inlet window through which the preheat burning flame within said gas generating-chamber may flow into said burning unit, and recirculation windows through which a part of the preheat burning flame entering into said burning unit may be recirculated back to said gas generating chamber, wherein said burning unit and said gas generating chamber are communicated to each other.

4,551,090

BURNER

Klaus Leikert; Gerhard Büttner, and Sigfrid Michelfelder, all of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation of Ser. No. 180,706, Aug. 25, 1980, abandoned. This application Dec. 19, 1983, Ser. No. 562,848

Int. Cl.⁴ F23M *9/00*

U.S. Cl. 431—188 **4 Claims**

1. A burner for combustion of fuel which contains nitrogen and for which purpose, said burner comprises in combination therewith:

a main air supply conduit;

a core-air tube which is in communication with said main air conduit;

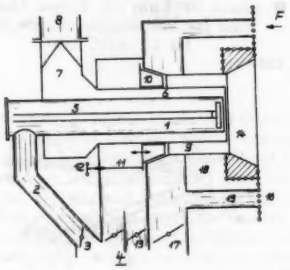
an oil atomizing lance centrally arranged in said core-air tube;

a dust tube which surrounds at least a part of said core-air tube;

a mantle-air tube which surrounds at least a part of said dust tube and is provided with an air inlet which is in communication with said main air supply conduit, said mantle-air tube being connected to and in communication with a burner opening which widens conically from said mantle-air tube toward a combustion chamber;

an axially shiftable twist blade ring arranged in said air inlet of said mantle-air tube and arranged as a twist producer essentially only for the mantle-air although adjustable axially;

at least two and up to a maximum of only six air nozzles concentrically arranged around said burner opening, said two to six air nozzles being in communication with said main air supply conduit, said two to six air nozzles being



arranged in a divided circle having a diameter in a range between minimum 1.5 and maximum 3 times the diameter of said mantle-air tube so that air flow supplied therewith is axially parallel and subdivided into a mantle-air flow and a stepped-air flow as supplied therewith; and

a flap for regulating the air flow through said two to only six air nozzles such that tertiary air is added axially parallel to the axis of the main flame and such that subdividing of tertiary air is kept from being too great because otherwise impulse, which in remaining or tertiary air divided into too great a number of partial flows, is insufficient in order to bring remaining or tertiary air sufficiently far into the combustion chamber, which means accordingly to bring oxygen to a location where oxygen is needed to attain an influence upon NO_x-reduction.

4,551,091

METHOD FOR REDUCING THE VOLUME OF ATMOSPHERE NEEDED TO INHIBIT INGRESS OF AMBIENT OXYGEN INTO THE FURNACE CHAMBER OF A CONTINUOUS HEAT TREATMENT FURNACE

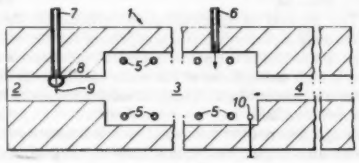
Alan J. F. Paterson, Crewe, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 30, 1984, Ser. No. 605,318

Claims priority, application United Kingdom, May 4, 1983, 8312167

Int. Cl.[4] F27B *9/04, 5/04;* **F27D** *7/00*

U.S. Cl. 432—23 **4 Claims**



1. A method for reducing the volume of atmosphere needed to inhibit ingress of ambient oxygen into the furnace chamber of a continuous heat treatment furnace having an entrance section, a furnace chamber, and an exit section, which method comprises the step of introducing an atmosphere containing less than 1,000 ppm of free oxygen into the furnace chamber to establish a working atmosphere within the furnace chamber, characterized in that said method further comprises the step of introducing into the upper portion of the entrance section and/or exit section of the furnace chamber a stream of gas containing free oxygen; and/or passing a stream of gas containing free oxygen across the mouth of said entrance section and/or exit section of said furnace chamber; whereby said stream creates a dynamic pressure or momentum force which deflects the working atmosphere exiting the furnace in a downward direction.

4,551,092

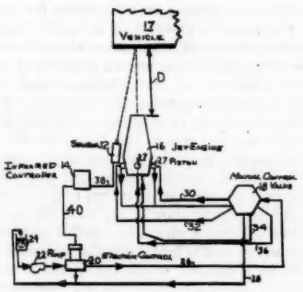
JET ENGINE DECONTAMINATION SYSTEM

William M. Sayler, Bradshaw, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 14, 1983, Ser. No. 550,855

Int. Cl.[4] F23J *3/00;* **F27B** *21/00*

U.S. Cl. 432—32 **5 Claims**



1. A system for decontaminating a vehicle contaminated by contact with toxic substances by burning said substances off the surface of said vehicle, said system comprising:

a. movable heating means for providing a universally movable source of high temperature heat for directing heat at a spot on said vehicle;

b. infrared temperature detector means directed toward said spot on said vehicle currently being heated, responsive to infrared radiation therefrom for generating an output signal proportionate to the instantaneous temperature of said spot;

c. transducer means, electrically connected to said detector means for activating controlling fluidic flow in response to attainment by the said spot of a predetermined temperature level;

d. controlling means, fluidically connected to said transducer means for generating fluidic control signals to a means for moving said heating means to aim said heat to another spot; and

e. said means for moving being fluidically coupled to said controlling means for causing said high temperature heat of said heating means to be moved to different spots on said vehicle for heating.

4,551,093

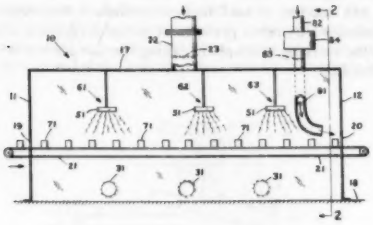
PRODUCTION OF A SOLID STICK IN A CONTAINER

Frederick P. Sisbarro, Wayne, N.J., assignor to Carter-Wallace Inc., New York, N.Y.

Continuation of Ser. No. 424,317, Sep. 27, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 647,254

Int. Cl.[4] F27B *9/28*

U.S. Cl. 432—59 **8 Claims**



1. An apparatus for treating a solid antiperspirant or deodorant stick composition in a container, comprising:

a protective tunnel having an inlet and an outlet; carrier means in said tunnel for moving a container including the solid stick composition through said tunnel between said inlet and said outlet; cooling means to maintain the tunnel at a temperature below the temperature of the solid stick composition for cooling the solid stick composition in the protective tunnel to effect solidification thereof, said cooling means comprising air inlet means for introducing air into the tunnel, a plurality of air outlet means vertically spaced from the air inlet means along the length of the tunnel for withdrawing air at a plurality of longitudinally spaced points in the tunnel between said inlet and said outlet, an air moving means for circulating air through the tunnel between the air inlet means and said plurality of air outlet means; and at least two longitudinally spaced heating station means within said tunnel for controlled localized heating of a portion of the solid stick composition in a container on said carrier means to a temperature above the melting temperature of the stick composition only at said heating station means to remelt a portion of the stick composition, said at least two heating station means being spaced by a distance within the tunnel whereby a liquid portion of the stick composition in a container is cooled by air circulating between the at least two heating station means to solidify the liquid portion prior to said controlled localized heating by the at least two heating station means.

4,551,094

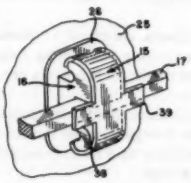
EDGEWISE BRACKET WIRE RETAINING CLIP

Peter C. Kesling, 611 W. 250 S., LaPorte, Ind. 46350

Filed Jan. 31, 1985, Ser. No. 696,783

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—8 **14 Claims**



1. In combination with an orthodontic bracket having a base adapted to be secured to a bracket pad or a tooth band and a body extending buccally from the base, said body having a buccal surface, a horizontally opening archwire slot along the buccal surface to receive an archwire, and a pair of tie wings on opposite sides of said slot, the improvement in a removable cap receivable on said body to retain the archwire in the slot and to enhance rotational control, said cap having a body of substantially the same width as that of the bracket, upper and lower retention hooks for engaging over the tie wings, and mesial and distal extensions generally coplanar with the body for engaging the buccal surface of the archwire to enhance rotational control.

4,551,095

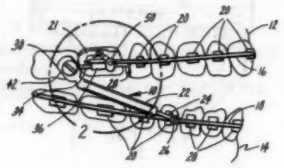
ATTACHMENT OF HERBST MECHANISM TO MAXILLARY ARCH

Charles W. Mason, 295 Kirby La., Bigfork, Mont. 59910

Filed Jan. 30, 1985, Ser. No. 696,556

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—19 **18 Claims**



1. In an orthodontic appliance of the type having corrective means for cooperative association between maxillary and mandibular arches for translating natural closure of the arches into an anatomically anterior corrective force on the mandibular arch, the improvement for attaching the corrective means to the maxillary arch which comprises fixation means including a tube for affixation to the maxillary arch with the length of the tube disposed mesial-distally, a shaft of a length greater than that of the tube passing completely through the tube so as to project both mesially and distally from the tube and to be mesial-distally displaceable with a sliding fit through the tube, connection of said corrective means to that portion of the shaft which projects distally from the tube, and a stop on said shaft mesial of said tube which forcefully bears against said fixation means with a distally directed force when corrective force is being developed on the mandibular arch by the corrective means and which is selectively positionable on the shaft to set the amount of distal extension of said connection from said tube at which said stop forcefully bears against said fixation means.

4,551,096

ORTHODONTIC APPARATUS AND METHOD FOR TREATING MALOCCLUSION

Eugene L. Dellinger, 4606A E. State St., Fort Wayne, Ind. 46805

Continuation-in-part of Ser. No. 562,858, Dec. 19, 1983,. This application Oct. 19, 1984, Ser. No. 662,727

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—24 **20 Claims**

1. The method of fabricating an orthodontic device for re-positioning a patient's teeth, comprising the steps of:

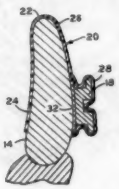
forming a model of the patient's teeth in the shape of a dental arch with the replicas of the teeth ideally located,

releaseably mounting brackets on selected replicas in preselected locations,

forming a fixture over the dental arch in intimate conformity with the respective replica crowns, lingual and labial surfaces and onto said brackets in securing engagement with the latter, said fixture being formed of a material which after being formed is relatively rigid and in that state not readily removable from said brackets but can be

subsequently altered as to its physical properties to facilitate removal from said brackets,

dividing replica portions of said fixture into units, one for each selected replica, the units corresponding to said selected replicas having brackets secured therein, making a maloccluded model of the patient's teeth, fitting the bracket-bearing units over the corresponding replicas of the maloccluded model and then forming a secondary fixture-retaining and transferring appliance over the



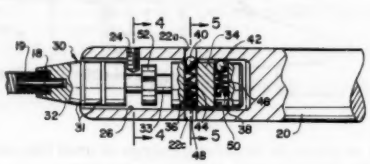
maloccluded model in intimate conformity therewith and in securing engagement with said bracket-bearing units, removing the secondary appliance and secured bracket-bearing units as an integrated assembly from the maloccluded model, applying said integrated appliance to the patient's teeth to locate and secure the brackets to the teeth, and removing the appliance and fixture units from the teeth including altering the physical properties of the units while in the patient's mouth for removal from the teeth.

4,551,097

DUAL-TORQUE WINDING AND TIGHTENING TOOL

Harry J. Lazarus, 36 Knox La., Englishtown, N.J. 07726

Filed Feb. 19, 1985, Ser. No. 702,496
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—39 **16 Claims**



1. A dual-torque winding tool for winding a coil of a retainerless dental matrix, comprising:

a handle adapted to be held and rotated in a hand;

a barrel over which said handle is rotatably mounted;

first torque transmitting means engageable between said handle and said barrel for transmitting rotation of said handle to said barrel up to a first selected torque;

second torque transmitting means engageable between said handle and said barrel for transmitting rotation of said handle to said barrel up to a second selected torque which is different from said first selected torque;

angled shaft assembly means connected to said barrel, and angled shaft means having a first end connected to said barrel and a second end remote from said barrel, said first and second ends of said angled shaft means being rotatable with rotation of said barrel; and

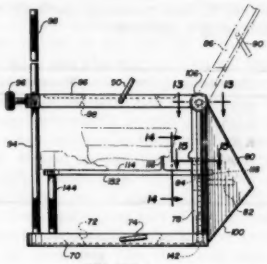
a winding head connected to said second end of said angled shaft assembly means adapted for engaging and winding a coil of a retainerless dental matrix.

4,551,098

METHOD AND APPARATUS TO PRODUCE ARTIFICIAL DENTURES

John J. Blair, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Jul. 1, 1983, Ser. No. 510,404
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—171 **16 Claims**



1. A method of forming a set of upper and lower artificial dentures having full arch sets of upper and lower artificial teeth comprising the steps of:

a. using negative impressions of a patient's upper and lower jaws to make therefrom upper and lower models of said jaws,

b. positioning a mounting table having thereon hamular notch positioning means in an articulator,

c. removably connecting said upper model to an upper member of said articulator which said model is in registry with said hamular notch positioning means,

d. removing said mounting table from operative position in said articulator,

e. removably connecting said lower model to a lower member of said articulator,

f. positioning an occlusal plane table means in said articulator,

g. placing the occlusal surface of said full arch set of upper teeth upon the upper surface of said occlusal plane table means,

h. attaching said full arch set of upper teeth to said upper model,

i. placing a full arch set of lower teeth in occlusion with the upper full arch set of teeth,

j. attaching said lower set of teeth to said lower model,

k. contouring moldable material to said models to resemble the shape of natural gums, and

l. removing said attached sets of teeth and moldable material from said models and processing the same into finished dentures.

11. A method for forming a full upper artificial dental prosthesis comprising positioning a model of a patient's upper jaw in space by supporting the model anteriorly and posteriorly with relating means comprising support means respectively engageable by right and left hamular notches of said upper model and also including graduated step means having increments of heights selectively engageable with the incisive papilla of said upper model.

4,551,099

CERAMIC DENTAL RESTORATIVE

Carlino Panzera, Belle Mead, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Continuation-in-part of Ser. No. 473,469, Mar. 9, 1983, Pat. No. 4,481,036. This application Jul. 18, 1984, Ser. No. 632,100

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.⁴ C09K *3/00*

U.S. Cl. 433—212.1 **1 Claim**

1. An all-ceramic dental restoration comprising a ceramic core and a translucent glaze, said glaze having a maturing temperature of from about 1700° to about 1900° F., and a coefficient of thermal expansion of from about 4 to about 9×10^{-6} in./in./°C., and consisting essentially of, on a weight basis, the following components:

Component	Proportion, %
SiO_2	71–74
Al_2O_3	10–12
K_2O	4–5
Na_2O	4–5
CaO	2–4.5
B_2O_3	3.5–5.5.

4,551,100

METHOD OF PREPARING GINGIVAL AREA FOR DENTAL CROWNS

Dan E. Fischer, Salt Lake City, Utah, assignor to Ultradent, Inc., Salt Lake City, Utah

Continuation of Ser. No. 386,103, Jun. 7, 1982, abandoned. This application May 22, 1984, Ser. No. 613,044

Int. Cl.⁴ A61K *5/00*

U.S. Cl. 433—218 **4 Claims**

1. A method for halting bleeding in gingival tissue preparatory to the taking of dental impressions, comprising the steps of:

providing an applicator device capable of applying a hemostatic solution of aqueous ferric sulfate ($Fe_2(SO_4)_3$) having a concentration in the range of about 6 percent to about 20 percent under pressure to an area of bleeding gingival tissue, said applicator device having a padded porous tip through which hemostatic solution may be applied;

inserting the tip of the applicator into a bleeding wound site;

placing the tip of the applicator device against bleeding tissue;

dispensing the hemostatic agent from the tip of the applicator device under pressure onto bleeding tissue; and

burnishing the bleeding tissue while simultaneously dispensing the hemostatic agent under pressure so as to halt bleeding of such tissue.

4,551,101

SIMULATOR FOR TRAINING AIRPLANE PILOTS

Jacques Neumann, Forest, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC)-Societe Anonyme, Brussels, Belgium

Filed Sep. 19, 1984, Ser. No. 652,019

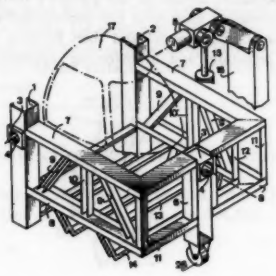
Claims priority, application European Pat. Off., Sep. 20, 1983, 83201347.8

Int. Cl.⁴ G09B *9/08*

U.S. Cl. 434—55 **6 Claims**

1. A simulator for training airplane pilots comprising a base positioned on the ground (**24**), a basket supporting an airplane equipment station, the interior of which reproduces the interior of a real cockpit (**17**) and an assembly of jacks (**15**) and scissors (**16**) arranged between the base (**24**) and the basket and actuated by means of a hydraulic control apparatus,

characterized in that the basket comprises a cross-braced, self-supporting structure (**18**), the bottom of which coincides with the bottom of the simulated cockpit (**17**) and the upper edge of which is located approximately at the height of the lower edges of the windows of the simulated cockpit (**17**), and wherein said jacks (**15**) and said scissors (**16**) connecting said base to said structure (**18**) are fixed in



at least three places in proximity to the upper edge of said structure (**18**) and are directed toward the base (**24**) positioned on the ground and spaced laterally from said structure.

4,551,102

METHOD AND DEVICE FOR DISPLAYING GRAPHIC INFORMATION, IN PARTICULAR FOR BRAILLE READING

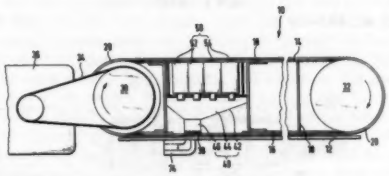
Karl Meinzer, an den Brunnenröhren 21, D-3550 Marburg, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 602,167

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314645

Int. Cl.⁴ G09B *21/00*

U.S. Cl. 434—114 **11 Claims**



1. A device for displaying patterns of small balls for braille reading purposes comprising in combination

(a) an endless belt containing a plurality of parallel rows of perforations,

(b) drive means to move said endless belt in a loop between two spaced apart drums,

(c) a ball feeding station located above the lower portion of the looped endless belt, which feeding station is adapted to deposit magnetizable balls in all of the perforations in the belt as the belt passes the feeding station,

(d) a ball removal station located beneath the upper portion of the looped endless belt, which station is adapted to selectively remove balls by electromagnetic means from certain of said perforations as the belt moves past said removal station,

(e) a reading area downstream of said removal station wherein the balls remaining in the perforations of the belt and which have a portion of each ball partially extending above the upper level of the belt can be read by tactile sensing of the balls,

(f) said ball removal station including a plurality of spaced apart electromagnetic means which are adapted to cause

the withdrawal of selected balls from said perforations with a force greater than gravitational force, and

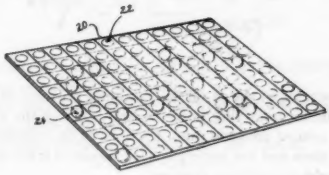
(g) electronic control means for controlling the said electromagnetic means so that the selective removal of balls from the perforations of said endless belt will result in a pattern of balls that will convey information to a person in the reading area.

4,551,103

FARM PRODUCTS AGRICULTURAL GAME

Vincent J. Vitale, Detroit, Mich., assignor to Mickey Green, Detroit, Mich.

Filed Nov. 15, 1984, Ser. No. 671,885
Int. Cl.[4] G09B *19/00*; A63H *33/42*
U.S. Cl. 434—225 **6 Claims**



1. A watermelon agriculture educational toy, comprising:

a board with spaced indentations for simulating a melon growing field;

a plurality of marbles placed in some of said indentations for simulating melons;

a set-up for manual removal of said marbles from said indentations; said set-up including a field truck model;

a second set-up for receiving of said marbles from said field trucks including a packing shed;

a belt conveyor positioned in said packing shed for removing said marbles from said field truck;

an over the road truck model parked alongside the said packing shed for receiving said marbles from said conveyor;

a commission house at a distant point for receiving said marbles from said over the road truck;

a plurality of bins positioned in said commission house for holding said marbles;

a city truck model parked next to said commission house; and

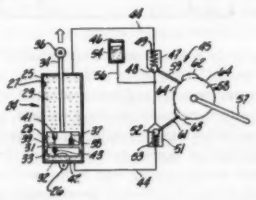
means for moving said bus into said city truck for delivery to retail stores.

4,551,104

TILT LOCK MECHANISM FOR MARINE PROPULSION DEVICE

Takashi Iwashita; Shinya Atsumi, both of Hamakita, and Ryoji Nakahama, Iwata, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Feb. 21, 1984, Ser. No. 582,186
Claims priority, application Japan, Feb. 22, 1983, 58-26994
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—56 **8 Claims**



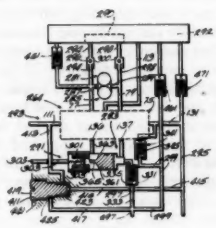
1. In a tilt locking and shock absorbing arrangement for a marine outboard drive comprising a drive member supported for tilting movement relative to a hull of an associated watercraft about a substantially horizontally disposeed tilt axis, a hydraulic assembly comprising a cylinder and a first piston slidably supported in said cylinder and defining first and second chambers, means for operatively interposing said hydraulic assembly between said hull and said drive member for relative movement of said first piston and said cylinder upon tilting movement of said drive member about said tilt axis, damping means for permitting flow from said first chamber to said second chamber upon the application of a predetermined force tending to cause said drive member to tilt up about said tilt axis and for permitting flow said second chamber to said first chamber upon the exertion of a predetermined force to effect tilt down of said drive member, and a second piston supported for movement in said cylinder within said second chamber and dividing said chamber into first and second parts, the position of said second piston being effective to control the normal trim position of the drive unit by restricing the movement of said first piston relative to said cylinder in one direction, passage means extending between said first chamber and the second part of said second chamber, first check valve means in said passage means for permitting flow from said first chamber to said second part of said second chamber and for precluding flow from said second part of said second chamber to said first chamber, and second check valve means in said passage means for permitting flow from said second part of said second chamber to said first chamber and for precluding flow from said first chamber to said second part of said second chamber, the improvement comprising the portion of the passage means extending between the first and second check valve means being substantially unrestricted so that opening of either of the check valve means causes the pressure in said passage means portion to act directly on the other of said check valve means, and control means for selectively opening one of said check valve means so that the other of said check valve means control the flow through said passage means or for closing both of said check valve means for precluding any flow through said passage means.

4,551,105

MARINE PROPULSION DEVICE WITH TILT AND TRIM MEANS WITH FLUID FILTERING

Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 19, 1983, Ser. No. 562,979
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—61 **17 Claims**



1. A marine propulsion device including a member adapted to be connected to a boat hull, a propulsion assembly pivotally connected to said member for vertical swinging movement when said member is attached to the boat hull, a plurality of hydraulic cylinder assemblies, each of said hydraulic cylinder assemblies including a hydraulic cylinder and a piston rod slidably received in said cylinder, and said hydraulic cylinder assemblies being mounted between said member and said propulsion assembly to effect said vertical swinging movement of

said propulsion assembly in response to movement of said piston rods in one direction relative to said cylinders and in the opposite direction relative to said cylinders, selectively rotatable pump means including first and second ports, said first port being pressurized in response to pump means rotation in one direction, and said second port being pressurized in response to pump means rotation in the other direction, and conduit means communicating between said first and second ports and said hydraulic cylinder assemblies for moving said piston rods in one direction relative to said cylinders in response to pump means rotation in one direction, and for moving said piston rods in the opposite direction relative to said cylinders in response to pump means rotation in the other direction, said conduit means also including a filter, and control means communicating with said filter for requiring substantially all of the fluid flowing from said hydraulic cylinder assemblies to said pump means to pass through said filter.

4,551,106

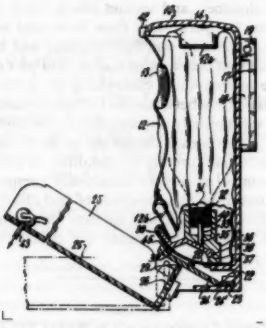
LIFE PRESERVING EQUIPMENT

Irwin D. Prager, 34 Malone Ave., Staten Island, N.Y. 10306

Filed Mar. 21, 1984, Ser. No. 591,856

Int. Cl.[4] B63C *9/16, 9/24*

U.S. Cl. 441—94 **7 Claims**



1. Life preserving equipment comprising an open sided housing to be carried by the user including a cover therefor, said housing containing an inflatable member tethered to the housing, said inflatable member enclosing a compressed gas cartridge including a diaphragm and a puncture mechanism therefor including a puncturing element and an actuating arm pivotally supported relative to said cartridge, engaging said puncturing element and extending outwardly therefrom, first lever means pivotally carried by said housing externally of said inflatable member and underlying said pivotally supported arm and second lever means carried by said cover and movably upwardly upon displacement of said cover, said second lever means engaging and displacing said first lever means upwardly upon displacement of said cover relative to said housing to apply pressure to said pivotally supported actuating arm at a point spaced outwardly from said puncturing element to effect release of said gas and inflate said member.

4,551,107

FLOTATION GARMENT

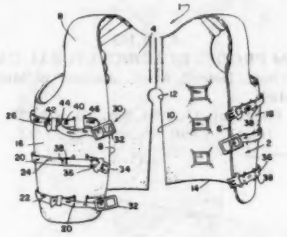
Robert S. Scheurer, and Stephen M. Scheurer, both of P.O. Drawer 539, Wichita Falls, Tex. 76307

Filed Feb. 1, 1983, Ser. No. 462,844

Int. Cl.[4] B63C *9/10*

U.S. Cl. 441—112 **17 Claims**

1. A flotation garment comprising a body-encircling portion constructed of polymeric foam material, the foam material being provided with parallel slits, thereby forming belt-loop means between the parallel slits for receiving body-encircling straps surrounding the garment, the flotation garment apparatus further comprising shoulder overlying portions connected to the body-encircling portion and wherein the shoulder overlying portion has rounded creases extending inward into the shoulder portions from surfaces of the shoulder portions, wherein the creases extend across the shoulder of a wearer



from outsides of the shoulder overlying portions to insides of the shoulder overlying portions, and wherein the creases are closely spaced adjacent outer portions of the shoulder overlying portions and are widely spaced adjacent inner portions of the shoulder overlying portions.

4,551,108

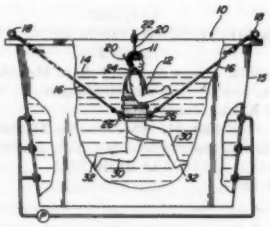
EXERCISE DEVICE FOR USE IN TANK CONTAINING WATER

Eric Bass, 10 Walton Ave., Doylestown, Pa. 18901

Filed Jan. 19, 1984, Ser. No. 572,264

Int. Cl.[4] A63B *23/00*

U.S. Cl. 441—116 **3 Claims**



1. A leg and body exercise device comprising a buoyant vest and a tank of water having sides and a bottom, said vest being made of a buoyant material and being adapted to be worn by a person in a upright running position in said tank, said vest having first vest loops attached adjacent the waist thereof, said tank having anchoring loops whereby adjustable security lines can be attached between said vest loops and said anchoring loops, said tank being of sufficient depth and being filled with sufficient water such that the exercising feet of the person do not touch the bottom of the tank.

4,551,109

MALLEABLE MATERIAL VEHICLE PLAYSET

Steven P. Hanson, Winnetka, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 22, 1985, Ser. No. 693,385
Int. Cl.⁴ A63H *17/00*
U.S. Cl. 446—95 **5 Claims**

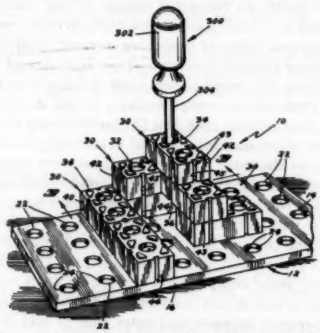
1. A children's activity playset comprising in combination:
a supply of malleable materials;
a chassis carrying free wheeling axle and wheel assemblies on the underside; and
a transparent body shell fitting over the chassis.

4,551,110

ROTATABLE CAM FOR USE IN A TOY CONSTRUCTION SET

Craig C. Selvage, Warwick, R.I., and Frank D. Ventura, Newburyport, Mass., assignors to CPG Products Corp., Minneapolis, Minn.

Filed May 24, 1984, Ser. No. 613,842
Int. Cl.⁴ A63H *33/12, 33/04, 33/06*
U.S. Cl. 446—118 **23 Claims**



20. For use in a toy construction set, a rotatable cam comprising a body portion having a slot extending from one end thereof toward the other end thereof, said body portion having a pair of oppositely directed flanges at said one end, each of said flanges having a cam surface on the side thereof facing toward said other end of the body portion, said body portion having a second pair of oppositely directed flange at its said other end, said second flanges being generally perpendicular to said first flanges.

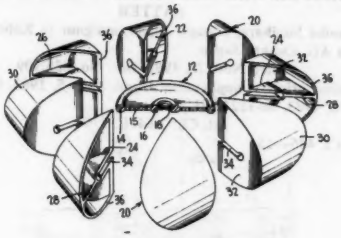
4,551,111

BALL-LIKE CONSTRUCTION FOR A TOY OR THE LIKE

Benjamin F. Sherman, Jr., 6329 Mori St., McLean, Va. 22101

Filed Aug. 25, 1983, Ser. No. 526,282
Int. Cl.⁴ A63H *33/06*
U.S. Cl. 446—120 **25 Claims**

1. A ball-like construction for a toy or the like comprising a plurality of hollow wedge elements,
each wedge element having an arcuate wall and an end wall,
an interior wall in each wedge element integral with said arcuate wall and said end wall and extending therebetween to strengthen each wedge element,



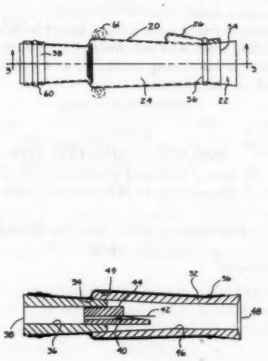
a disc member centrally located within said plurality of hollow wedge elements, and
interconnecting means between said disc member and the interior wall of each wedge element to retain said plurality of hollow wedge elements on said disc member as a unit.

4,551,112

PROTECTIVE COVER FOR WATERFOWL CALLERS

William E. Johnson, 3107 State Rd., #227 N, Richmond, Ind. 47374

Filed Dec. 22, 1983, Ser. No. 564,287
Int. Cl.⁴ A63H *5/00*
U.S. Cl. 446—207 **9 Claims**



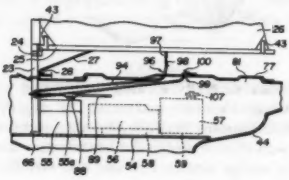
1. In a waterfowl caller having a generally tubular barrel supporting an adjustable reed and a generally tubular mouthpiece interfitting with said barrel in removable relation thereto, the improvement comprising an elastic tubular protective cover of rubber or the like supported in an expanded encircling position upon said waterfowl caller extending from a mouthpiece end of said caller to a barrel end of the caller over an interfitting junction of the mouthpiece and the barrel, said cover being held in tight frictional engagement upon both the mouthpiece and barrel of the caller to resist any tendency of the mouthpiece to be removed from the barrel, said cover having a mouthpiece end provided with a cap member connected by a fold portion to a main body section of the cover, said cap member being expandable to fit over and close an open end of the mountpiece of the caller in protective relation

thereto when the caller is not in use and being foldable back against the mouhtpiece when the caller is in use.

4,551,113
RADIO CONTROLLED YACHT AND SAIL FOR THE LATTER

Hironobu Sugihara, Hyogo, Japan, assignor to Kabushiki Kaisha AG, Osaka, Japan

Filed Nov. 25, 1983, Ser. No. 555,109
Claims priority, application Japan, Aug. 5, 1983, 58-143156; Aug. 5, 1983, 58-122131[U]
Int. Cl.[4] A64H *23/04*
U.S. Cl. 446—154 **15 Claims**

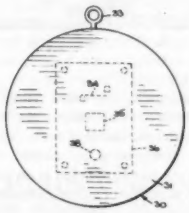


1. In a radio controlled yacht of the type including a hull having an interior and an exterior, a sail having a sheet attached thereto for controlling the placement of said sail relative to the centerline of said yacht, a control unit which comprises a receiver, a sail servo having a rotatable output shaft, a rudder servo and a battery so that lengthening and shortening of said sheet attached to said sail are controlled by means of said sail servo and the turning angle of a rudder is controlled by means of said rudder servo, the improvement comprising an eyelet fastened to said yacht near said centerlines, a sail trimmer arm fixedly secured to said output shaft so that said trimmer arm rotates under control of said sail servo, said sail trimmer arm being formed with a sheet insert hole at one end, said sheet extending from said sail through said eyelet, through said sheet insert hole and being anchored at a predetermined position located on the yacht.

4,551,114
IMPACT-ACTIVATED TOY

Gregory E. Hyman, 12 Chester Pl., Bronxville, N.Y. 10708, and Lawrence J. Greenberg, 43 Wilputte Pl., New Rochelle, N.Y. 10804

Filed Feb. 4, 1983, Ser. No. 463,844
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—397 **5 Claims**

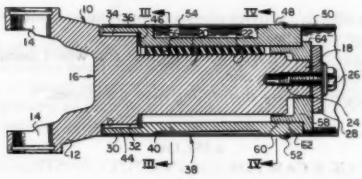


1. An impact-activated toy comprising:
a housing which in its entirety is freely displaceable by an external impact thereon;
an impact-responsive momentary switch mounted in said housing and adapted to be actuated in response to displacement of said housing in its entirely by such impact;
electronic sound generating means responsive to actuation of said switch for generating a sequence of musical melodies appealing to a child in response to successive momentary actuations of said switch caused by successive external impacts on, and displacement of, said housing spaced by less than a predetermined interval from the termination of a preceding melody.

4,551,115
DRIVESHAFT COUPLING WITH ELASTOMER DAMPER

Robert J. Ferguson, Marshall, Mich., assignor to Simpson Industries, Inc., Litchfield, Mich.

Filed May 23, 1984, Ser. No. 613,197
Int. Cl.[4] F16D *3/10*
U.S. Cl. 464—83 **2 Claims**



1. A driveshaft coupling characterized by its vibration damping characteristics comprising, in combination, an elongated drive member having an axis of rotation, an outer end, an inner end, and an elongated central stem, a universal joint receiving yoke defined upon said outer end, said stem having four first flat surfaces extending the length thereof defining a rectangular transverse cross section and each surface having a width and length, an elongated tubular driven member surrounding said stem having an internal bore, an outer end and an inner end located adjacent said drive member inner end, said driven member internal bore comprising four second flat surfaces extending the length of said stem defining a rectangular transverse cross section complementary to said drive member transverse cross section, each first flat surface being in opposed radially spaced substantially parallel relationship to a second flat surface, an elastomer pad interposed between opposed flat surfaces each having a width, length and normal non-compressed radial thickness, the width of said pads being slightly less than the width of said first flat surfaces and said opposed first and second surfaces being radially spaced from each other a distance less than said normal pad radial thickness whereby said pads are under compression, a propeller shaft concentrically affixed to said driven member, a radially disposed thrust bearing interposed between said outer ends of said drive and driven members, a metal insert mounted upon said drive member inner end and maintained thereon by fastening means, said insert engaging said driven member inner end axially forcing said driven member toward said thrust bearing, said insert including means for preventing axial displacement of said driven member relative to said drive member and an axially extending tubular portion having flat outer surfaces complemental to and closely engaging said second surfaces preventing relative rotation between said insert and said driven member, said tubular portion further having rectangularly related inner surfaces in opposed radially spaced relation with said first surfaces, the radial spacing between opposed inner surfaces and said first surfaces being less than the radial spacing between said first and second surfaces whereby said first and inner surfaces are engageable upon a predetermined relative rotational movement between said drive and driven members to establish a direct torsional driving relationship between said drive and driven members.

4,551,116
DRIVE SHAFT ASSEMBLY

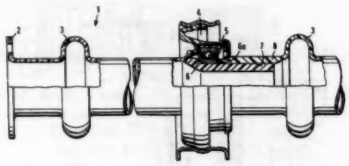
Werner Krude, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,443

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320760

Int. Cl.[4] F16C *3/02*; B60K *17/24*

U.S. Cl. 464—97 **6 Claims**



1. A drive shaft assembly for transmitting torque between two relatively movable drive and driven members, particularly suitable for use in a motor vehicle between a transmission and a differential, comprising, in combination:

a first tubular shaft part and a second tubular shaft part, each of said shaft parts consisting essentially of the same fiber reinforced plastics material arranged coaxially relative to each other and permanently secured together;

a circumferentially radially outwardly extending fold formation formed in at least one of said first and second shaft parts providing for articulation of said shaft assembly;

an integrally formed flange arranged at the opposed ends of said drive assembly, one on each of said shaft parts for enabling said shaft assembly to be connected for torque transmission; and

an intermediate support bearing carried on said drive shaft assembly between said opposed ends at least approximately adjacent the connection between said first and said second shaft parts;

said intermediate support bearing including an inner bearing ring, said first and second shaft parts each having surfaces defining a stepped formation receiving said inner bearing ring.

4,551,117
DEVICE FOR TRANSMITTING TORQUE TO A REEL OR THE LIKE

Wolfgang Kunz, Lörrach-Hauingen, Fed. Rep. of Germany, assignor to Kunz Maschinen- und Apparatebau GmbH, Lörrach-Hauingen, Fed. Rep. of Germany

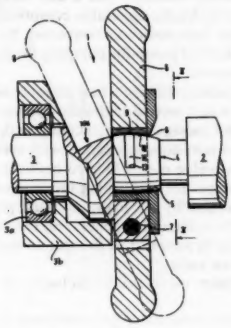
Filed Jul. 12, 1983, Ser. No. 513,211

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228739

Int. Cl.[4] F16D *3/00*; F16B *1/04*

U.S. Cl. 464—106 **18 Claims**

1. A separable torque transmitting connection between at least substantially coaxial driving and driven rotary members, such as between a shaft and the core of a reel, comprising a substantially round male coupling element coaxial and rigid with one of said driving and driven members, provided with a lateral flat and having a predetermined thickness as considered in a Plane including the axis of said coupling element and extending at right angles to the flat; a female coupling element coaxial and rigid with the other of said driving and driven members and defining a socket complementary to said male coupling element and having a lateral opening communicating with said socket and having a width at least matching said thickness so that said male coupling element is insertable into and withdrawable from said socket via said opening on movement of at least one of said coupling elements to an angular position in which said flat is out of register with said opening so that the latter permits the male coupling element to pass therethrough, said coupling elements being movable to angular positions in which said flat extends across said opening; and means for releasably holding said coupling elements in such angular positions, said holding means comprising a blocking member mounted on said female coupling element for pivotal movement about an axis which is normal to the axis of said



female coupling element, said blocking member having a surface which is at least substantially complementary to said flat and being pivotable to and from a position in which said surface thereof overlies said flat while said flat extends across said opening.

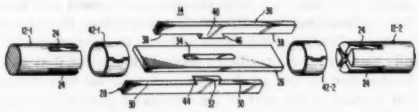
4,551,118
COUPLED DRIVE SHAFT

Albert S. Spisz, Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 5, 1984, Ser. No. 586,281

Int. Cl.[4] F16B *2/06*

U.S. Cl. 464—182 **23 Claims**



1. An apparatus for coupling together two sections of shaft, two longitudinal slots passing through the periphery of one end of each of said two shaft sections, said apparatus comprising:

joining means, engageable with said two longitudinal slots in the end of each shaft section, for transmitting a force applied to one of said shaft sections to the other of said shaft sections; and

clip means, securable over the slotted end of each of said shaft sections, for maintaining said joining means in engagement with said two longitudinal slots in the end of each shaft section.

4,551,119
HYDRAULIC APPARATUS FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Masami Sugaya, Susono; Daisaku Sawada, Gotenba, and Susumu Okawa, Numazu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 14, 1984, Ser. No. 579,969

Int. Cl.[4] F16H *11/04*

U.S. Cl. 474—28 **14 Claims**

1. A hydraulic apparatus for a continuously variable transmission for motor vehicles having a driving pulley with a first fixed memeber and a first movable member, the movable mem-

ber being actuated by a first hydraulic cylinder to form a V-shaped opening between the fixed and movable first members, a driven pulley with a second fixed member and a second movable member, said second movable member being similarly actuated by a second hydraulic cylinder to form a similar V-shaped opening between said second fixed member and said second movable member, and a belt member spanning said pulleys, said hydraulic apparatus comprising:

a hydraulic fluid reservoir containing hydraulic fluid;

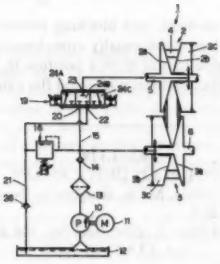
a hydraulic fluid pump for pumping the hydraulic fluid from the reservoir;

a first oil passage having a first pressure and connecting said pump to said second hydraulic cylinder;

a second oil passage communicating with said reservoir and having a port communicating with said first oil passage;

a regulator valve means located between said first and second passages for controlling the pressure of the hydraulic fluid pumped by the hydraulic fluid pump to the second hydraulic cylinder for generating the first pressure which is constantly supplied to the second hydraulic cylinder of the driven pulley;

said regulator valve means including a first oil chamber



having an inlet communicating with a second oil chamber within said regulator valve means and an outlet communicating with said second oil passage, said second oil chamber communicating with said first oil passage through an orifice, a first valve member located at the inlet of the first oil chamber for controlling a second pressure of hydraulic fluid in said second oil chamber, and a second valve member located at the port of the second oil passage for controlling a first pressure of hydraulic fluid in said first oil passage, the outlet of the first oil chamber being defined within the second valve member, said second valve member being biased to open the port of the second oil passage by the first pressure and being biased in an opposite direction by the second pressure;

a first electric control means connected with the regulator valve means, for varying the value of the first pressure;

hydraulic fluid flow control means for controlling the volume of hydraulic fluid supplied to or drained from the hydraulic cylinder of the driving pulley; and

a second electric control means connected with the hydraulic fluid control means, for varying the volume of hydraulic fluid supplied to or drained from the hydraulic cylinder of the driving pulley.

4,551,120

BELT TENSIONER

Henry W. Thomey, Windsor, Canada, assignor to Dyneer Corporation, Westport, Conn.

Filed Apr. 10, 1984, Ser. No. 598,837

Int. Cl.[4] F16H *7/12*

U.S. Cl. 474—135 **12 Claims**

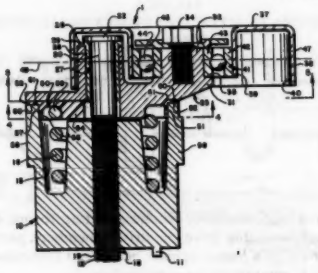
1. A belt tensioner construction for automatically tensioning an endless drive belt of the drive system for vehicle accessories, said tensioner construction including:

(a) a bracket adapted to be mounted on a vehicle engine adjacent the drive belt;

(b) a shaft mounted on the bracket;

(c) lever means pivotally mounted on the shaft and extending generally radially outwardly from the shaft for pivotal movement toward and away from the drive belt;

(d) spring means biasing the lever means in the belt tensioning direction; and



(e) pulley rotatably mounted on the lever means and engageable with the drive belt for applying a tensioning force on said belt when the lever means is biased by the spring means in a belt tensioning direction toward the drive belt, with an outer end of the shaft lying within the periphery of the pulley.

4,551,121

FRONT DERAILLEUR FOR A BICYCLE

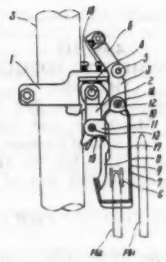
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 2, 1984, Ser. No. 595,680

Claims priority, application Japan, Apr. 1, 1983, 58-58338

Int. Cl.[4] F16H *7/22, 11/08, 7/18*

U.S. Cl. 474—140 **9 Claims**



1. A front derailleur for a bicycle, which shifts a driving chain from one to another of at least two front chain gears comprising a larger diameter chain gear and a smaller diameter chain gear, said derailleur comprising a chain guide comprising an inner plate, an outer plate, and a connecting member connecting said inner and outer plates substantially parallel to each other and spaced at an interval larger than a width of said chain, said inner plate having a swollen portion expanded toward said outer plate for pushing out said chain toward said larger diameter chain gear, said swollen portion being disposed between a first chain traversing position where said chain, while being shifted from said smaller diameter chain gear to said larger diameter chain gear, traverses said chain guide at an initial raising stage in which said chain is initially raised relative to said chain gears by contact with said larger diameter chain gear and a second chain traversing position where said

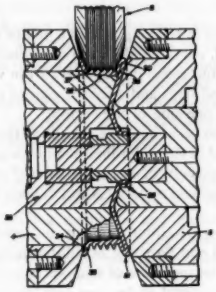
chain traverses said chain guide at a final raising stage in which said chain is maintained in a raised position relative to said chain gears before completion of shifting of said chain to said larger diameter chain gear.

4,551,122

MANUFACTURE OF POLY-V SHEET METAL PULLEYS AND PRODUCT

Derald H. Kraft, Canton, and Gary L. Hitchcock, Massillon, both of Ohio, assignors to Dyneer Corporation, Canton, Ohio

Filed Feb. 22, 1983, Ser. No. 468,654
Int. Cl.⁴ F16H *55/44*; B21D *53/26*
U.S. Cl. 474—170 **13 Claims**



1. In a poly-V grooved pulley of the type having a V-grooved body wall formed from a sheet metal pulley blank in which the body wall has an annular radially thickened portion located between out-turned single and double walled flanges connected to axial end portions of said body wall, in which said out-turned flanges extend angularly axially outward from V-grooves in said body wall connecting said out-turned flanges with the radially thickened body wall portion, and in which a pulley web wall is joined to said double walled flange; wherein the improvement comprises:

(a) an inner surface of said body wall having a stepped contour in cross section extending between said body wall axial ends said V-grooves in said body wall each including a V-groove valley and V-groove peaks, the valley being located closer to said inner surface stepped contour than said peaks;

(b) the stepped contour being defined by a series of cylindrical portions increasing in diameter from the axial end of the body wall connected to the double walled flange to the axial end of the body wall connected to the single walled flange;

(c) the radial thickness of the thickened body wall metal at the valley of the V-groove adjacent said single walled flange being thinner than the radial thickness of the thickened body wall metal at the valley of the poly-V groove adjacent said double walled flange; and

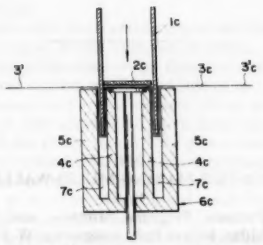
(d) said stepped contour being substantially equivalent to a tapered surface such that the body wall in cross section acts as a cantilever beam to provide substantially uniform torque transmitting strength for said thickened poly-V grooved body wall from the axial end of said body wall connected to said double walled flange to the axial end of said body wall connected to said single walled flange.

4,551,123

WATER-PROOF PAPER CONTAINER AND ITS MANUFACTURING METHOD

Hiromichi Inagaki, 1-143, Aza Maedaomote Inuyama-shi, Aichi, Japan

Filed Oct. 19, 1983, Ser. No. 543,319
Int. Cl.⁴ B31B *1/90*
U.S. Cl. 493—108 **7 Claims**



1. A method of manufacturing a container comprising:

covering a paper base member with a heat-shrinkable plastic film having a pair of walls with a space therebetween, the paper base member being positioned between the walls and in the space;

removing air from the space between the walls to pull the walls of plastic film against the paper base member;

sealing at least a portion of the plastic film to close the space in an air tight manner after removing air from the space;

forming the base member into a container shape having at least one open end; and

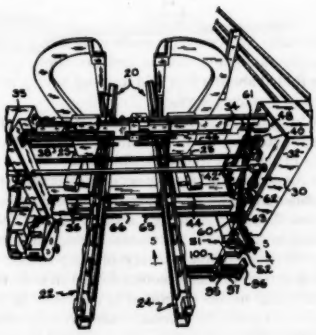
covering the at least one open end with a cover to close the at least one open end of the container shape.

4,551,124

CORRUGATED BOX MACHINE GLUE APPARATUS

Donald E. Mowry, Norwalk, Ohio, assignor to Don Mowry Flexo Parts, Inc., Norwalk, Ohio

Filed Feb. 3, 1983, Ser. No. 463,570
Int. Cl.⁴ B31B *1/62, 3/60*
U.S. Cl. 493—128 **7 Claims**



1. A gluing apparatus for an adjustable machine for manufacturing corrugated boxes of a plurality of sizes comprising: a first conveyor belt means and a second conveyor or belt means, said first and second conveyor belt means being adjustably spaced from one another to convey varying sizes of boxes, adjustment means operatively connected to said first and second conveyor belt means for adjusting the space between said first and second conveyor belt means, a glue dispensing means adjacent said second conveyor belt means for applying glue to

the edge of corrugated board stock during the manufacture of a corrugated box and positioning means operatively connecting said glue dispensing means to said adjustment means for automatically re-indexing said glue dispensing means adjacent the edge of the corrugated board stock, when said adjustment means is activated, to accommodate different size corrugated board stock.

4,551,125

APPARATUS FOR MAKING MULTI-WALLED PLASTIC BAGS

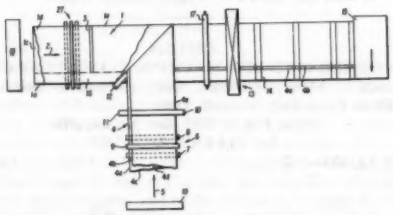
Francesco Pezzana, Pregnana Milanese, and Cesare Quacquarella, Milan, both of Italy, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 449,915, Dec. 15, 1982, abandoned, which is a continuation of Ser. No. 185,833, Sep. 11, 1980, abandoned, which is a division of Ser. No. 52,171, Jun. 26, 1979, Pat. No. 4,273,549. This application Mar. 16, 1984, Ser. No. 589,855

Claims priority, application United Kingdom, Jun. 26, 1978, 7827884/78

Int. Cl.[4] B31B *1/10, 39/02*

U.S. Cl. 493—217 **7 Claims**



1. Apparatus for forming a multi-walled bag comprising:

means for supplying, from a first direction, a first flexible film folded about a first fold line and having inwardly and outwardly facing surfaces;

means for partially unfolding said first flexible film;

means for treating part of both of the inwardly facing surfaces of said first folded flexible film;

means for supplying, from a second direction substantially coplaner and inclined with respect to said first direction, a second flexible film folded about a second fold line and having inwardly and outwardly facing surfaces;

means for treating the entirety of both of the outwardly facing surfaces of said second folded flexible film;

diverter guide means supported in cantilevered fashion and adapted to guide the second flexible film into said partially unfolded first flexible film whereby said second fold line of said second flexible film is brought into substantial register with the first fold line of said first flexible film;

pressing means for contacting the treated part of the inwardly facing surfaces of said first flexible film with the treated outer surfaces of said second flexible film whereby the films are bonded together in a non-releasable manner; and

sealing means for transversely sealing said flexible films to form a bag.

4,551,126

METHOD OF CARTON FLAP RELAXING

A. David Johnson, Jr.; Joseph L. Bachman, Jr., both of Wayne; George E. Ginther, Sr., King of Prussia; Charles E. Zimmermann, Elverson, and Albert D. Johnson, Sr., St. Davids, all of Pa., assignors to Wayne Automation Corp., Norristown, Pa.

Filed Nov. 9, 1983, Ser. No. 550,136

Int. Cl.[4] B31B *1/48*

U.S. Cl. 493—453 **9 Claims**

1. The method of relaxing at least a pair of opposite end flaps on a four panel, corrugated carton comprising the steps of:

providing a four panel corrugated carton with a first pair of opposite end flaps and a second pair of opposite end flaps on at least one side of the carton;

applying water on at least the outside of the carton to at least the material of the outer liner comprising at least the score lines respectively of one pair of end flaps in sufficient quantity that said material is wet at least through the outer liner; and

while said wet condition remains and while both said first and second end flaps are in substantially closed position, raising the temperature of said wet material sufficiently to cause the material to become substantially dry and then terminate said raising of the temperature whereby each of said one pair of end flaps assumes a substantially closed position subsequent to said termination.

4,551,127

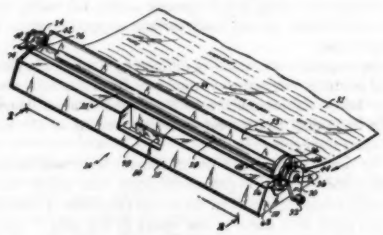
TOY STRUCTURAL MEMBER ROLLER

Hubert A. Rich, Westminster; Gary M. Saffer, Torrance, and William F. Sestito, Lakewood, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 1, 1982, Ser. No. 438,092

Int. Cl.[4] B31C *1/00*

U.S. Cl. 493—462 **6 Claims**



1. Apparatus adapted to form tubular structural members by rolling flexible sheets of material;

said apparatus comprising a base; first and second bearing members held within said base;

a tube assembly having two ends rotatably supported at its ends in said bearing members, and including a pair of elongated, hollow inner and outer tubes having slots

formed therein and means limiting the relative rotation of said inner and outer tubes;

a crank connected to one of said elongated hollow tubes for rotation of said tube assembly;

ratchet means connected to said other of said elongated hollow tubes for rotation therewith;

a pusher element slidably mounted on said elongated hollow outer tube;

a ratchet spring pivotedly mounted on said base and including stop means coacting with a slot formed in said ratchet means for limiting rotation of said crank in one direction while allowing said crank to be freely rotatable in the outer direction;

a tension bar pivotably mounted on said base and coacting therewith so as to provide pressure against flexible material passing over said base and being wound around said outer tube upon turning of said crank in said other direction; and

said bearing member holding the end of said outer tube distant from said crank being moveably mounted on said base whereby said bearing member may be moved to align an enlarged opening formed therein with a tubular structural member formed on said tube assembly to enable said formed tubular structural member to be removed therefrom by action of said pusher sliding along the length of said outer tube from a position adjacent to said crank toward said opening in said pivotable bearing member.

6. Apparatus to form tubular structural members from flexible material, comprising in combination:

a base;

first and second bearing members held within said base;

a tube assembly having two ends rotatably supported at its ends in said bearing members, and including a pair of elongated, hollow inner and outer tubes having slots formed therein and means limiting the relative rotation of said inner and outer tubes;

a crank connected to said elongated, hollow inner tube for rotation of said elongated, hollow inner tube, and said tube assembly;

a ratchet connected to said elongated, hollow outer tube for rotation therewith;

a pusher element slidably mounted on said elongated, hollow outer tube;

a ratchet spring means pivotedly mounted on said base and cooperating with said ratchet for limiting rotation of said tube assembly in one direction while allowing said tube assembly to be freely rotatable in the other direction; and

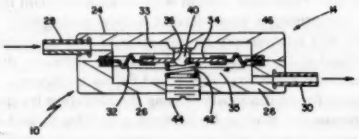
a tension means mounted on said base to coact with said flexible material as it is passing over said base and being wound around said outer tube.

4,551,128

CEREBROSPINAL FLUID SHUNT VALVE

Salomon Hakim, Carrera 13, N. 48-26, Bogota, Colombia, and Carlos A. Hakim, 3400 Galt Ocean Dr., Apt. 1702 S., Fort Lauderdale, Fla. 33308

Filed May 11, 1983, Ser. No. 493,748
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—9 **31 Claims**



1. A surgically-implantable shunt valve for venting cerebrospinal fluid in the treatment of hydrocephalus and for shunting other body fluids, said valve comprising

a housing constructed of a surgically-implantable, non-metallic material,

a diaphragm support consisting of a single flexible diaphragm mounted within said housing,

a plate mounted on said flexible diaphragm, said plate being provided with a circular aperture and said diaphragm having an opening aligned with said aperture.

said diaphragm being generally coplanar with said plate,

said diaphragm and plate dividing said housing into an inlet and an outlet chamber that communicate through said aperture,

said inlet and outlet chambers being generally free of blind cavities so as to inhibit collection of debris,

a valve element of diameter larger than said aperture, said valve element residing on the inlet side of said aperture,

means for biasing said valve element signal the circular periphery of said aperture so as to keep said aperture closed until the cerebrospinal fluid pressure in said inlet chamber exceeds a preselected popping pressure and so as to open said aperture when said popping pressure is exceeded so as to vent cerebrospinal fluid through said aperture into said outlet chamber,

said popping pressure being on the order of cerebrospinal fluid pressures (i.e, less than 300 mm H_2O,)

said housing including inlet and outlet ports communicating with said inlet and outlet chambers respectively for connecting said inlet and outlet chambers to external catheters or other fluid conduits, and

screw means for making external adjustments to said preselected popping pressure.

4,551,129

TECHNIQUE AND APPARATUS FOR INTRAOCULAR AND MICROSURGERY INCLUDING LIGHTER-IRRIGATOR HYPODERMIC TUBE

D. Jackson Coleman, 515 E. 71st St., New York, N.Y. 10021; Donald E. Orcutt, 3 Honeyman Dr., Succasunna, N.J. 07876, and Herbert Berkowitz, 50 Lenox Ter., West Orange, N.J. 07052

Filed Apr. 8, 1983, Ser. No. 483,279
Int. Cl.[4] A61B *17/36, 5/02*
U.S. Cl. 604—21 **20 Claims**

1. A system including, in an operation area, a lighter-irrigator for intraocular and other microsurgery which comprises in combination:

a source of light having a preselected focal area;

a cannula having a hub portion with a relatively wide opening on one end in a plane transverse to and substantially centered on the major axis of the hub of the cannula, said hub opening being disposed in a proximal direction within said focal area of said source of light, at least a portion of said light is directed in the general direction of said major axis, said hub being connected in a distal direction along said axis to a frustoconical member decreasing in internal diameter to a relatively small opening;

a thin-walled elongated hypodermic tube being accommodated in said small opening and extending in a proximal direction internally into the hub of said cannula, and extending for a substantial length axially in a distal direction from said small opening;

a light guide comprising an elongated body of light transmitting material interposed into said cannula extending axially along the interior of said cannula and axially along the length of said hypodermic tube, said light guide terminat-

ing at its proximal end in a light funnel of frustoconical shape which laterally seals against and projects beyond the proximal end of said hypodermic tube, said light guide terminating in a light-projecting lens which seals the end of said tube;

a source of liquid for infusion into the said eye during surgery;

a liquid intake pipe for connection to said source of liquid connected into the hub of said cannula;

said hypodermic tube having at least one liquid intake opening near its proximal end in said cannula hub and at least one liquid exhaust opening near its distal end;

an annular space between the light guide and the hypodermic tube forming a channel for transmitting said liquid in a direction substantially parallel to said light guide from said at least one intake opening to said at least one exhaust opening;

a longitudinal fiber optic light pipe for the transmission and dispersion of light which extends from a source substantially spaced-apart from one end of said cannula to a plane adjacent to a relatively larger opening of said cannula, the light from said optic light pipe being substantially focused on said light funnel for concentration on the light transmitting light guide enclosed in said hypodermic tube;

said fiber light pipe comprises in combination:

a flexible core of light transmitting material;

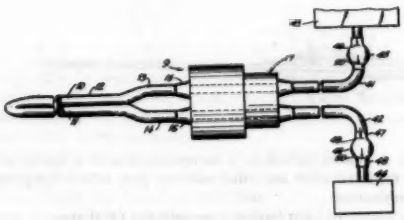
a sleeve of transparent or translucent material tightly surrounding said core in a manner to substantially eliminate air from the interface between said core and said sleeve, said sleeve and said core being constructed and arranged to laterally diffuse, disperse or refract through the sidewall of said sleeve a substantial component of the light transversing said core longitudinally.

4,551,130

SURGICAL DRAINAGE AND IRRIGATION APPARATUS FOR POST OPERATIVE PATIENT CARE

William B. Herbert, RD #2, Box 448, Pine Bush, N.Y. 12566, and Rohit A. Patel, 39 Gregory Dr., Goshen, N.Y. 10924

Filed May 8, 1984, Ser. No. 608,244
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—32 **8 Claims**



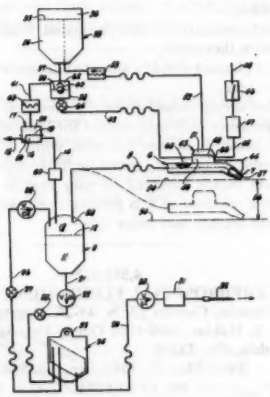
1. A post-operative drainage and irrigation apparatus comprising a control valve, a substantially cylindrical core member in said valve having a longitudinal axis, a distributor rotatably secured to the core member and overlying at least a portion of said core, a first and a second spaced bore longitudinally traversing the valve core parallel to but spaced from the said longitudinal axis, a third and a fourth spaced bore in the distributor parallel to but spaced from the longitudinal axis, said first and second bores and third and forth bores being spaced from each other a distance which will bring them into alignment within the control valve in at least two rotation modes of the valve core with respect to the distributor, a first and a second port on the valve core in communication with the first and second bores in said core, a third and fourth port on the distributor in communication with the third and fourth bore in the distributor, stop means carried by the valve core and the distributor to limit the rotation of said core and distributor with respect to each other, a catheter for attachment to the control valve, a first and a second lumen formed within the catheter, said catheter having a proximal end for insertion within a body cavity and a distal end for attachment to the ports of the control valve distributor, a source of irrigation solution, a first flexible tube interconnecting the solution source with one of the ports on the valve core, normally open squeeze bulb valve means incorporated into the said tube between the solution source and control valve, a second flexible tube connected at one end to the other port of the valve core and adopted to discharge liquid coming out of said port, a second normally open squeeze bulb valve means incorporated into said second tube and means carried within the control valve to prevent liquid passing through the valve bores from escaping from between the valve core and distributor at all modes of valve operation.

4,551,131

AUTOTRANSFUSION SYSTEM WITH ANTICOAGULANT DELIVERY SYSTEM

Clive Miles, Oakland, and Gary Schneiderman, Walnut Creek, both of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed May 2, 1983, Ser. No. 490,673
Int. Cl.[4] A61M *1/00, 5/00*
U.S. Cl. 604—31 **34 Claims**



1. An autotransfusion system with an anticoagulant delivery system comprising a wand having a flow passageway therethrough, said passageway having an inlet and an outlet, said wand adapted to be raised and lowered between different predetermined elevations above and below a reference elevation, means for continuously sensing the elevation level of said wand, means for moving liquid from said inlet to said outlet, means responsive to said sensing means for controlling said liquid moving means in accordance with the different elevations of said wand to afford a substantially predetermined movement of said liquid from said inlet to said outlet at said raised and lowered positions of said wand.

4,551,132

PHARMACEUTICALLY ACCEPTABLE SILICON RUBBER AND THERAPEUTICAL SET AND THE USE THEREOF FOR SURGICAL EMBOLIZATION

Emil Pásztor, 4, Rákóczi-u, Budapest, Hungary (1072); László Lázár, 4, Rózsahegy-u, Budapest, Hungary (1024); József Nagy, 46/b, Törökbálinti-u, Budapest, Hungary (1122), and Katalin Pállosy née Becker, 31, Vincellûr-u, Budapest, Hungary (1113)

Division of Ser. No. 235,084, Feb. 17, 1981, Pat. No. 4,429,062. This application Dec. 1, 1982, Ser. No. 445,690

Claims priority, application Hungary, Feb. 18, 1980, 369/80

Int. Cl.[4] A61B *17/12*

U.S. Cl. 604—52 **1 Claim**

1. In a method of embolization wherein an occlusion is formed in the vascular system by the vulcanization of an embolization agent in situ the improvement comprising said embolization agent being a silicone rubber component having reactive functional groups selected from the groups consisting of hydroxyl, acyloxyl, alkoxyl, and amino; a cyclic dialkylpolysiloxane and a pharmaceutically acceptable iodo-containing organosilicium or non-metallic organic X-ray contrast material, and a component B comprising an effective amount of a therapeutically acceptable cross-linking catalyst.

4,551,133

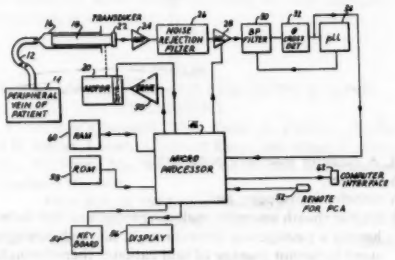
PATIENT CONTROLLED MEDICATION INFUSION SYSTEM

Rene H. Zegers de Beyl, Glendale, and Stephen J. Coble, Sunland, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Apr. 16, 1984, Ser. No. 600,663

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—66 **18 Claims**



1. A medication infusion system comprising:

an infusion line for introducing medication to a peripheral vein of a patient;

pump means along the infusion line for delivering medication through the infusion to the peripheral vein of the patient;

pressure transducer means in fluid wave communication with medication in the infusion line for converting sensed fluid pressure waves to electrical signals;

amplifier means electrically connected to the pressure transducer means for increasing the strength of the electrical signal;

gain controlled amplifier means electrically connected to the amplifier means for maintaining the electrical signal at a predetermined amplitude regardless of the input amplitude variations of the electrical signal;

tracking filter means electrically connected to the gain controlled amplifier means for filtering the electrical signal provided by the pressure transducer means through the gain controlled amplifier means to provide an electrical signal representative of the patient's respiration rate over a preselected full clinical respiration rate range;

a computer means operatively connected to the tracking filter means for deriving from the electrical signal a control signal for controlling the operation of the pump means which is operatively connected to the computer means, the computer means comprising:

means for determining the presence of an electrical signal representative of the patient's respiration rate;

clock means for converting the electrical signal to a rate signal representative of the patient's respiration rate;

first comparing means for comparing the rate signal with a preselected respiration rate;

storage means for storing each rate signal; and

incremental motor control means for providing a signal to the pump means for actuating the pump means in preselected increments when the rate signal is present and is greater than the preselected respiration rate and for providing a signal to the pump means to stop such pump means when no electrical signal is detected.

4,551,134

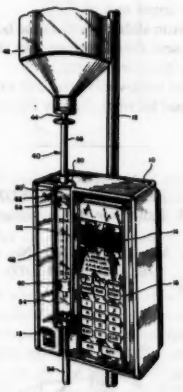
INTRAVENOUS SET

William H. Slavik, Palos Hills, and William B. Huber, Oak Park, both of Ill., assignors to Nuvatec, Inc., Downer's Grove, Ill.

Filed Aug. 6, 1982, Ser. No. 406,117

Int. Cl.[4] A61M *5/16*

U.S. Cl. 604—67 **23 Claims**



1. In an intravenous set comprising an input port, first means for connecting the input port to a container, a tube, and second means for connecting the tube to an insertion device adapted to introduce fluids into a living subject, the improvement comprising:

a drip chamber comprising means for forming fluid into drops, said drip chamber comprising means at a first location for accomodating remote detection of the rate at which drops are formed by the forming means;

a volumetric chamber mounted upstream of the drip chamber such that fluids passing from the volumetric chamber flow to the drip chamber, a portion of said volumetric chamber having a precalibrated volume between a second and a third location spaced along the volumetric chamber and both separated from the first location, said portion comprising means for accomodating remote detection of the fluid level inside the volumetric chamber at said second and third locations of said volumetric chamber to indicate when said precalibrated volume has been emptied from the volumetric chamber;

means for connecting the drip chamber to the tube such that the tube receives fluid which has flowed from the drip chamber; and

means for connecting the volumetric chamber to the input port such that the volumetric chamber receives fluid

which has flowed from the input port, said means for connecting the volumetric chamber to the input port comprising externally actuated means for selectively and reversably interrupting fluid flow from the input port to the volumetric chamber.

4,551,135

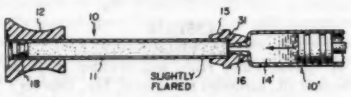
SYRINGE FOR EXTRUSION OF SEMI-PLASTIC MATERIAL

William G. Gorman, East Greenbush, and David A. Byron, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 275,861, Jun. 22, 1981, abandoned. This application May 19, 1982, Ser. No. 379,779

Int. Cl.⁴ A61B *5/10*; B43K *5/06*

U.S. Cl. 604—82 **35 Claims**



1. A mixing/dispensing syringe for use in the extrusion of a wetted, semi-plastic mass which comprises in combination:

A. a barrel of generally uniform wall thickness which is closed at its upper end by

B. a flexible piston slidable within the bore of said barrel and providing a seal therebetween and the inside wall of the barrel along its entire length, and

C. a plunger rod removably attached to said piston, wherein the bore of said barrel is slightly flared from its upper to its lower end.

4,551,136

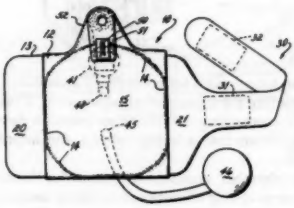
PRESSURE INFUSOR

Joseph P. Mandl, Lancaster, Ohio, assignor to Medex, Inc., Hilliard, Ohio

Filed Apr. 11, 1983, Ser. No. 483,767

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—141 **2 Claims**



1. A pressure infusor comprising,

a transparent polyurethane outer sheet approximately 0.035 inch thick,

a transparent polyurethane inner sheet approximately 0.035 inch thick and overlying said outer sheet with approximately a 2.5 inch margin of said outer sheet projecting beyond said inner sheet at opposed edges thereof,

a continuous seal around the coextensive portions of said sheets to form a closed pressure bladder,

said 2.5 inch margins extending along said entire edges of said bladder,

one of said margins at least partially overlying the other margin when said outer sheet is wrapped around a fluid-containing plastic bag, said polyurethane margins having a high coefficient of friction when in said overlying relation, thereby resisting opening said outer sheet,

an elongated narrow strap projecting approximately 17 inches from one of the margins,

said strap totally surrounding said pressure bladder and fluid-containing bag and overlying said margins when said outer sheet is wrapped around a plastic fluid-containing bag,

said strap having cooperating Velcro fastening strips secured thereto to fasten said strap around said bag,

means for applying fluid under pressure to said bladder and means for measuring said pressure.

4,551,137

FLEXIBLE SHEATH ASSEMBLY FOR AN INDWELLING CATHETER

Thomas A. Osborne, Bloomington, Ind., assignor to Cook Incorporated, Bloomington, Ind.

Filed Oct. 7, 1982, Ser. No. 433,256

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—171 **8 Claims**

1. A catheter assembly comprising:

a catheter;

a catheter introducer; and

a flexible sheath assembly including front and rear hubs each having a passageway therethrough, said hub passageways sized to permit passage of said catheter therethrough, and a flexible sheath sealingly secured to said front and rear hubs and capable of longitudinally expanding from a collapsed position wherein said sheath forms a series of tightly packed folds contracted on an axis parallel to the length of said catheter, said sheath in its collapsed position defining a central passageway aligned with said front and rear hub passageways for receiving and guiding said catheter through said sheath during assembling of said catheter assembly, said flexible sheath having a rigidifying set biasing it into said collapsed position.

4,551,138

CANNULA DEVICE AND MEDICAL BAG HAVING THE SAME

Shuichi Shinohara, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 422,942, Sep. 24, 1982, abandoned. This application Mar. 20, 1985, Ser. No. 714,342

Claims priority, application Japan, Mar. 12, 1982, 57-39244

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 604—262 **40 Claims**

1. An autoclave-sterilized cannula device, comprising:

a hollow needle;

a hub which supports said hollow needle at a proximal end portion of said hollow needle and which is made of a hard plastic;

a protector comprising a hollow body whose distal end portion is closed and whose proximal end portion is open and which is made of a hard plastic, said protector being detachably mounted on said hub such that said hollow body houses said hollow needle therein, and said proximal end portion of said hollow body covers a distal end portion of said hub; and

a resilient layer which is formed between an inner circumferential surface of said proximal end portion of said hollow body and an outer circumferential surface of said distal end portion of said hub, wherein said resilient layer has a hardness in the range of 30 to 80 and a compression set of 20–80% after heating at 100° C. for 22 hours;

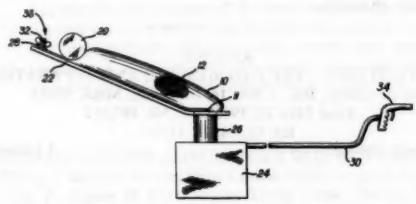
wherein said resilient layer is operative to maintain a hermetic seal between said hub and said protector both before and after being subjected to an autoclave sterilization environment, and wherein said resilient layer is operative to also maintain a liquid-tight seal between said hub and said protector after being subjected to said autoclave sterilization environment.

4,551,139

METHOD AND APPARATUS FOR BURN WOUND TREATMENT

Jon R. Plaas, Lee's Summit, Mo.; Keith E. Parker, Olathe; James D. Keiser, Leewood, both of Kans., and Elmer C. Johnson, Jr., Raytown, Mo., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Feb. 8, 1982, Ser. No. 346,920
Int. Cl.[4] A61M *11/00*
U.S. Cl. 604—290 **7 Claims**



1. A method for spray application of a burn treating agent comprising:

(a) delivering a viscous cream or ointment burn treating agent to an outlet in a flexible container of the treating agent without interruption;

(b) pressurizing a flow of the treating agent from the outlet to a spray nozzle in a conduit flow course;

(c) reducing the pressure of the pressurized flow in the nozzle to provide an atomized spray of agent; and

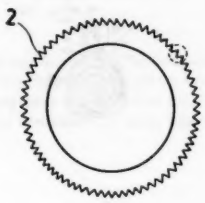
(d) delivering said low pressure atomized spray of agent from the nozzle against a burn wound surface.

4,551,140

TUBE FOR MEDICAL INSTRUMENTS AND MEDICAL BAG DEVICE HAVING THE SAME

Shuichi Shinohara, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,245
Claims priority, application Japan, Apr. 1, 1982, 57-54714
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—262 **21 Claims**



8. A heat-sterilizable medical bag device, comprising:

a flexible bag for holding a medical solution therein and made of a resin which exhibits a blocking or adhesive characteristic under elevated temperatures corresponding to an autoclave sterilization, and

an elongated tube for fluid connection at one end thereof with said bag and also made of said resin which exhibits said blocking or adhesive characteristics at said elevated temperatures corresponding to an autoclave sterilization,

said tube having a multiplicity of ribs extending substantially in the axial direction on the outer peripheral surface of said tube, said ribs being arranged around the periphery of said tube, said ribs each having a base side adjacent said tube and a crest radially outwardly of said tube, the cross-section of each rib having a length along the base side ranging between 0.15 and 0.26 mm, and a height ranging between 0.007 and 0.04 mm as measured from the base side to the crest of each of said ribs, whereby sticking together of mutually contacting portions of said ribbed tube during said autoclave sterilization is substantially prevented.

4,551,141

METHOD AND APPARATUS FOR REMOVING LIQUIDS FROM A DRAINAGE DEVICE

Charles B. McNeil, Edina, Minn., assignor to Surgidyne Inc., Buford, Ga.

Filed Aug. 2, 1983, Ser. No. 519,723
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—317 **12 Claims**

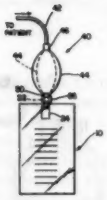
1. A method for removing collected liquid from a portable closed wound suction drainage device which reduces contamination of the drainage device and cross infection from the use of the drainage device comprising the steps of;

providing a catheter and collapsible suction reservoir having a one way valve at the inlet and having a single outlet,

providing a rolled up collapsible collection bag having an inlet with a one way valve therein and retaining means to hold the bag in a rolled up condition,

attaching the inlet of the collection bag to the outlet of the collapsible suction reservoir to provide fluid communication between the suction reservoir and the collection bag when the one way valve in the collection bag is open,

removing the retainer means from the collapsed rolled up collection bag,



collapsing the suction reservoir to close the one way valve at the inlet of the suction reservoir and to open the one way valve in the collection bag to force liquid from the suction reservoir into the collection bag,

removing the filled collection bag and attaching another rolled up collapsible collection bag to the outlet of the suction reservoir and

releasing the suction reservoir to create a suction within the reservoir and to open the one way valve at the inlet of the suction reservoir and to maintain the one way valve in the collection chamber closed.

4,551,142

FLEXIBLE ABSORBENT BOARDS

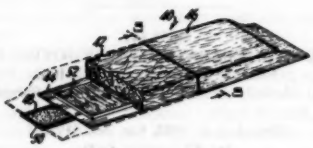
Steven L. Kopolow, Plainsboro, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation of Ser. No. 407,221, Aug. 11, 1982, abandoned, which is a division of Ser. No. 82,400, Oct. 5, 1979, Pat. No. 4,354,901. This application Jun. 6, 1984, Ser. No. 617,786

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—368 **17 Claims**



1. A product made by the process comprising:

forming a slurry of water is no more than about 0.1% by weight solids, said solids comprising cellulosic fibers and particulate hydrocolloidal material in a ratio of at least 0.01 grams of hydrocolloidal material per gram of cellulose fibers;

forming a wet web from said slurry;

drying said web to a water content of less than 10.0% by weight to form an undensified dry web;

and increasing the density of said dry web by at least 10%;

whereby said densified dry web has a high tensile strength and low stiffness relative to said undensified dry web, said densified web having a tensile of at least 10 kg/cm^2, a Gurley Stiffness of less than 40 grams, and a thickness of more than 0.3 mm.

4,551,143

NONWOVEN FIBROUS PRODUCT AND METHOD OF MAKING SAME

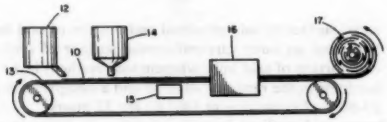
John R. Cook, Downers Grove, and William A. James, Tinley Park, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Continuation of Ser. No. 366,509, Apr. 8, 1982, abandoned, which is a division of Ser. No. 194,511, Oct. 6, 1980, Pat. No. 4,391,869. This application Jun. 21, 1984, Ser. No. 622,399

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—371 **6 Claims**



1. A disposable diaper comprising: a moisture-impervious backing sheet; an absorbent batt positioned in superposed relationship with respect to the backing sheet, the batt being smaller than the backing sheet and spaced inwardly from the longitudinal sides thereof; and a moisture pervious facing fabric positioned in superposed relationship with respect to the batt on the side opposite the backing sheet, the facing being larger than the batt and having longitudinal side margins thereof secured to the backing sheet, said facing fabric consisting essentially of a low density, resin-bonded, nonwoven fabric of resilient, synthetic, staple fibers selected from the group consisting of polyethylene, polyester, polypropylene, nylon and acrylic fibers and having a density less than about 0.06 gm/cc at 0.16 lb/sq. in. load, and a weight less than about 3 oz/sq. yd., said fabric during formation having been impregnated with a binder to provide a solution pickup of less than about 180 percent and a dry-solids-add-on from about 30 percent to about 50 percent.

4,551,144

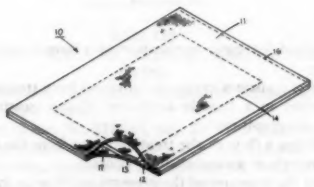
INCONTINENT CARE PAD METHOD AND APPARATUS

Helen E. Graber, Rte. 1, Box 14, Montrose, Minn. 55363

Filed May 25, 1983, Ser. No. 497,952

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—378 **4 Claims**



1. An incontinent care pad comprising:

a top layer of soft liquid permeable non-abrasive material;

a bottom layer of liquid repellant material secured about a

substantial portion of the periphery thereof to said top layer;

an inner layer of soft absorbent material having smaller lateral and longitudinal dimensions than said top layer, said inner layer being disposed directly between said top and bottom layers and attached to said top layer but not to said bottom layer whereby the inner layer can slide with respect to the bottom layer but not with respect to said top layer.

4,551,145

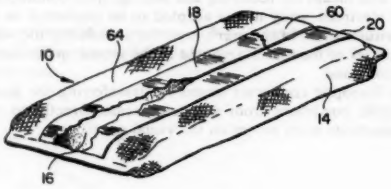
SANITARY NAPKIN

Lizabeth L. Ryan, Music Vale Rd., Salem, Conn. 06415

Filed May 14, 1984, Ser. No. 609,591

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—389 **25 Claims**



1. A sanitary napkin comprising,

an elongated wad of absorbent material having an upper surface and a lower surface with said lower surface adapted to face away from a wearer's body,

a sheet member of substantially moisture-impervious flexible material of sufficient dimensional size to form an enclosure of said wad for disposal and being folded in a first configuration to form a moisture shield covering the lower surface of said wad and being invertible into a second configuration to form a enclosure for said wad with said enclosure having a sealable opening,

said sheet member being disposed adjoining said lower surface of said wad and having first and second opposing side portions facing away from said lower surface of said wad in said first configuration, said side portions defining said sealable opening when said sheet is inverted into said second configuration to form an enclosure for said wad, and

pressure adhesive means disposed on at least one of said first and second side portions of the sheet member for attaching said wad to a supporting garment for wearing in said first configuration and for sealing closed said sealable opening of said enclosure when said sheet member is inverted into said second configuration for disposal.

4,551,146

CONNECTOR FOR AMBULATORY DIALYSIS SYSTEM

Phillip P. Rogers, Rolling Hills Estates, Calif., assignor to Phillip P. Rogers & Faye Rogers Living Trust, Rolling Hills Estates, Calif. and Uatar DTD., Rolling Hills Estates, Calif., Phillip P. Rogers & Faye Rogers, co-trustees

Continuation-in-part of Ser. No. 157,268, Jun. 9, 1980, Pat. No. 4,354,490. This application Sep. 30, 1982, Ser. No. 431,333

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.⁴ A61J *7/00*

U.S. Cl. 604—403 **14 Claims**

1. A peritoneal dialysis fluid connecting device comprising;

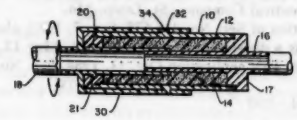
enclosure means;

an absorbent packing material in said enclosure means;

said absorbent packing material being substantially saturated with a disinfectant solution;

a first tube connecting end for supplying a peritoneal dialysis fluid;

a second tube connecting end adapted to telescopically mate with and connect to said first tube connecting end;



means allowing said first and second tube connecting ends to be telescopically mated inside said enclosure means so that the connecting ends are bathed in said disinfectant solution when the connection is being made and throughout use.

4,551,147

APPARATUS FOR RUNNING OFF LIQUIDS FROM SEALED VESSELS

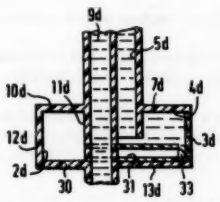
Bernd Mathieu, and Wolfram Weber, both of Spiesen, Fed. Rep. of Germany, assignors to Fresenius AG, Hamburg, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,442

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203954

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 604—405 **17 Claims**



1. An apparatus for running off a liquid from a sealed vessel containing said liquid during both vacuum and pressure conditions within said vessel comprising:

a liquid duct communicating with the inside of said vessel for discharging said liquid from said vessel to its outside;

an air duct communicating on one end with the inside of said vessel and on the other end in communication with the atmosphere via an air filter means for introducing air into said vessel to equalize the pressure within said vessel with the atmosphere during the discharge of liquid from said vessel; wherein

a space is disposed in said air duct in a location adjacent said air filter means being characterized in that said space is arranged as an air storage chamber or air trap which retains a body of air adjacent said air filter means even during pressurized conditions within said vessel when liquid is forced to said air duct by pressure within said sealed vessel and retained therein by said air filter means and wherein said body of air decreases the vacuum necessary to initiate air flow through said air filter means by expanding to contact said air filter means upon creation of vacuum conditions within said vessel.

4,551,148

VAGINAL DELIVERY SYSTEMS AND THEIR METHODS OF PREPARATION AND USE

Thomas C. Riley, Jr., Manchester, Mo.; Charles P. Tharp, Belleville, Ill., and Galen G. Lapka, St. Louis, Mo., assignors to KV Pharmaceutical Company, St. Louis, Mo.

Continuation of Ser. No. 415,675, Sep. 7, 1982, abandoned, which is a division of Ser. No. 263,026, May 12, 1981, abandoned. This application Oct. 11, 1984, Ser. No. 663,145

Int. Cl.[4] A61F *5/46, 13/00*

U.S. Cl. 604—890 **9 Claims**

1. Vaginal delivery systems which are bioadherent to the vaginal surfaces and which release an active agent in a controlled manner for at least three hours to a receptor site, site of action, site of absorption, or site of use consisting essentially of liquid or semi-solid adjacent unit cells having common lipoidal external phases, nonlipoidal internal phases and emulsifiers.

4,551,149

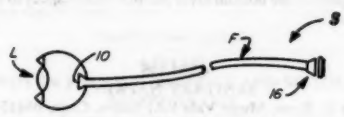
PROSTHETIC VISION SYSTEM

Michael J. Sciarra, 59 Far Pond Rd., Southampton, N.Y. 11968, assignor to Michael Sciarra, Southampton, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,179

Int. Cl.[4] A61F *1/16, 1/24;* **A61N** *1/04*

U.S. Cl. 623—4 **15 Claims**



1. A prosthetic vision system for a vision-impaired user, comprising:

(a) lens means for receiving and sensing optic conditions;

(b) electrode array means adapted to be implanted on the visual cortex of the user's brain for stimulating the visual cortex of the user in response to the sensed optical conditions; and

(c) fiberoptic conductor means for transferring the sensed optic conditions from said lens means directly to said electrode array means on the visual cortex.

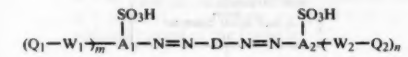
4,551,150

METHOD FOR DYEING CELLULOSE FIBER MATERIAL USING FIBER-REACTIVE DISAZO DYE AND FINISHING THE SAME

Katsumasa Otake, Nara; Takashi Ikeda, Yao; Takashi Omura, Ashiya, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

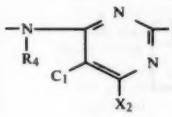
Filed Jun. 4, 1984, Ser. No. 617,032
Claims priority, application Japan, Jun. 7, 1983, 58-102208
Int. Cl.[4] D06M *15/16;* D06P *3/66, 1/38*
U.S. Cl. 8—496 7 Claims

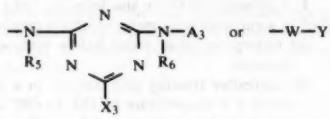
1. A method for producing dyed and finished products of cellulose fiber materials, which comprises dyeing cellulose fiber materials with a dye represented by a free acid of the following formula (I),



(I)

wherein each of the groups, $-W_1-Q_1$ and $-W_2-Q_2$ in the formula (I) is independently a group represented by the following formula,





wherein R_4, R_5 and R_6 are independently a hydrogen atom or a lower alkyl group, X_1 is a fluorine or chlorine atom or a methylsulfonyl group, X_2 is a fluorine or chlorine atom or a methyl group, X_3 is a fluorine or chlorine atom, W is a direct linkage, a methylene group or a group of

(in which R_4 is as defined above), Y is a group $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z$ (in which Z is a group capable of being split by the action of an alkali), A_3 is a hydrogen atom, an alkyl, phenyl or naphthyl group unsubstituted or substituted, or group of $-A_4-Y$ (in which Y is as defined above and A_4 is a phenylene or naphthylene group unsubstituted or substituted), A_1 and A_2 are independently a phenylene or naphthylene group unsubstituted or substituted, D is a residue of 1-amino-8-naphthol mono- or di-sulfonic acid, m and n are independently 0, 1 or 2, provided that they satisfy the formula, $0<m+n\leqq 2$, and each sulfo group appended to A_1 and A_2 is located at the carbon atom adjacent to the azo group, and then finishing the dyed fiber materials with a finishing agent capable of bonding with cellulose through a bridge formation wherein the finishing agent is at least one member selected from the group consisting of N-methylol compounds, aldehyde compounds of the formula, R'—CHO, in which R is a hydrogen atom or an alkyl, cycloalkyl or haloalkyl group, acetal compounds of the formula, $R'-CH(OR'')_2$, in which R' is a hydrogen atom or an alkyl, cycloalkyl or haloalkyl group, and R'' is a hydrogen atom or an alkyl group, epoxy compounds, vinyl compounds, aziridinyl compounds, polycarboxylic acid compounds, acylhalide compounds, isocyanate compounds and quaternary ammonium compounds.

4,551,151

DYESTUFF COMPOSITION: DISPERSE OR VAT DYE AND LIGNIN SULPHONATE

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 601,049
Int. Cl.[4] D06P *67/02*
U.S. Cl. 8—524 20 Claims

1. An improved dyestuff composition comprising a dye cake, selected from the group consisting of disperse and vat dyes, and a dispersant comprised of a sulfonated lignin prepared by reacting lignin material with an aldehyde and a sulfite, selected from the group of water soluble sulfites and bisulfites, wherein the improvement comprises the steps of

(a) selectively isolating the lignin material from alkaline black liquor by reducing the black liquor pH such that all but a negligible amount of the lignins having a molecular weight of 5,000 or less remain in solution with the black liquor,

(b) acidifying the lignin material to a pH of from about 1.5 to about 5.0 by washing with sulfuric acid followed by adding water to the lignin material to form a slurry of about 25% solids,

(c) adding to the lignin slurry the sulfite and the aldehyde in a sulfite to aldehyde mole ratio of from about 1.1:0.1 to about 2.5:1.0, which addition produces an initial reaction pH of from about 8.0 to about 9.2, and

(d) the temperature of reaction is raised from ambient to from about 130° C. to about 175° C. for from about 0.5 to about 12 hours.

4,551,152

ALCOHOL FUEL ANTI-WEAR ADDITIVE

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

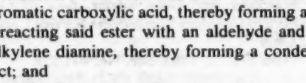
Filed Apr. 1, 1985, Ser. No. 718,580
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—78 20 Claims

1. A fuel composition for an internal combustion engine comprising:

(a) a major portion of a fuel containing (i) a C_1–C_2 alcohol and (ii) 0–50 volumes of gasoline per volume of alcohol; and

(b) a minor wear-inhibiting amount of, as a wear-inhibiting additive, a condensate product of the process comprising:

(i) reacting a polyol



wherein a+c is 1–20 and b is 5–50, with a hydroxy aromatic carboxylic acid, thereby forming an ester; and

(ii) reacting said ester with an aldehyde and an N-alkyalkylene diamine, thereby forming a condensate product; and

(iii) recovering said condensate product.

4,551,153

FUEL VAPOR GENERATOR

Vann Y. Won, 6697 Gloria Dr., Sacramento, Calif. 95831

Filed Mar. 7, 1984, Ser. No. 586,956
Int. Cl.[3] F02M *17/16*
U.S. Cl. 48—102 R 18 Claims

1. A vapor generator comprising:

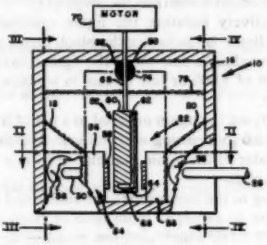
a housing, said housing having a chamber at the bottom thereof, and a screen wall, said screen wall defining and being included as part of said chamber;

means attached to said housing for introducing a liquid into said chamber from a liquid source;

means attached to said housing for permitting the removal of

excess liquid from said chamber and for returning sdid excess liquid into said chamber;

means situated within said chamber for regulating the level of said liquid within said chamber, said liquid level regulating means including a pair of floats, each of said floats having an arm pivotally mounted to said housing and connected at one end thereof to said float and the other end thereof having a stopper thereon in communication with said means for introducing liquid into said chamber and said means for permitting the removal of excess liquid from said chamber, respectively, whereby said level of



liquid within said chamber may be maintained within a preselected range;

means positioned within said chamber and bounded by a portion of said screen wall for atomizing said liquid, said atomizing means spraying said liquid in mist form into the upper portion of said housing for vaporization thereof; and

means located at said upper portion of said housing for permitting said vaporized liquid to be withdrawn from said housing;

wherein any unvaporized liquid falls back into said chamber for further atomization.

4,551,154

GAS TRACER COMPOSITION AND METHOD

Norman D. Malcosky, and Greg Koziar, both of Columbus, Ohio, assignors to Columbia Gas System Service Corporation, Columbus, Ohio

Filed Mar. 2, 1983, Ser. No. 471,278

Int. Cl.⁴ E21F *17/00;* **B65G** *5/00;* **F17D** *3/04;* **G01N** *33/22*

U.S. Cl. 48—193 **12 Claims**

1. A method for tagging methane during underground storage of methane, said method comprising adding to said methane a tracer compound, said tracer compound having the properties of (1) not occurring in natural supplies of methane, (2) diffusing through any underground methane storage field in a manner very similar to methane, and (3) substantially insoluble in petroleum distillates, said compound being selected from the group consisting of sulfur hexafluoride and chloropentafluoroethane, and thereafter passing said methane in gaseous form into an underground gas storage field having petroleum distillates therein,

the amount of tracer compound passage into the field being great enough that said tracer may be detected after said tracer is uniformly disbursed throughout the field.

4,551,155

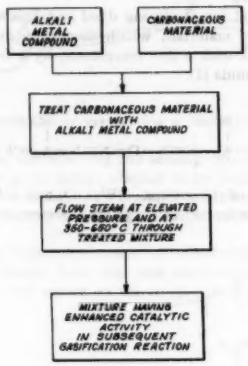
IN SITU FORMATION OF COAL GASIFICATION CATALYSTS FROM LOW COST ALKALI METAL SALTS

Bernard J. Wood, Santa Clara; Robert D. Brittain, Cupertino, and Kenneth M. Sancier, Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 7, 1983, Ser. No. 511,767

Int. Cl.⁴ C10J *3/06*

U.S. Cl. 48—197 R **15 Claims**


ALKALI METAL COMPOUND
CARBONACEOUS MATERIAL
TREAT CARBONACEOUS MATERIAL WITH ALKALI METAL COMPOUND
FLOW STEAM AT ELEVATED PRESSURE AND AT 350–650° C THROUGH TREATED MIXTURE
MIXTURE HAVING ENHANCED CATALYTIC ACTIVITY IN SUBSEQUENT GASIFICATION REACTION

1. A process for the in situ formation of a gasification catalyst in a carbonaceous material which comprises:

(a) mixing an alkali metal halide with said carbonaceous material;

(b) thereafter treating said mixture in a stream containing steam at a temperature of 350° to 650° C. for a sufficient time period to hydrolyze at least 25 mole% of said alkali metal to form a hydrolyzed product in the substantial absence of any gasification to enhance the catalytic activity of the resultant mixture in subsequent gasification of said mixture;

(c) utilizing high pressure steam at a high space velocity to remove the HCl gas as it is formed in said hydrolysis reaction; and

(d) passing the resultant gasification catalyst product to a gasification zone.

4,551,156

PERMSELECTIVE MEMBRANE COMPOSITIONS FOR GAS SEPARATIONS AND PROCESS FOR THE SEPARATION OF GASES THEREWITH

George S. Li, Macedonia, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Jan. 16, 1984, Ser. No. 570,816

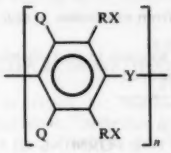
Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—16 **33 Claims**

15. A process for the separation of gases from a mixture containing at least two gases comprising the step of:

passing said mixture over a permselective membrane composition wherein said membrane composition is formed by a polymer membrane having

from about 25 to 100 parts by weight of a polyarylene having the formula

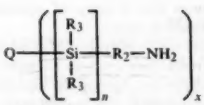


wherein R is a C_1 to C_8 aliphatic radical, a C_5 to C_7 cycloaliphatic radical, a C_1 to C_8 alkoxy radical, a C_6 to C_{12} aryl radical, an aralkyl radical or an alkaryl radical, each radical being free of a tertiary alpha-carbon atom; X is H, Cl or Br; Y is a divalent oxygen or sulfur atom or a sulfonyl or carbonate group; Q is H, Cl, Br, or a sulfonyl radical of the formula

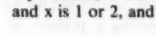
where R_1 is a C_1 to C_{20} linear or branched hydrocarbon or a nonpolymeric aryl radical; and n is an integer of from about 75 to 10,000;

from about 0 to 75 parts by weight of a crosslinkable copolymer, the copolymer being present at least when the polyarylene component is devoid of crosslinkable cites; and

from about one to 50 parts by weight, based upon the total weight of said polyarylene and crosslinkable copolymer, of a silicon-containing amineterminated compound selected from the group consisting of the siloxanes having the formula



wherein R_2 is a C_1 to C_{12} aliphatic radical or a C_1 to C_{12} aliphatic radical containing a primary or secondary amine, R_3 is a C_1 to C_{12} aliphatic radical or a C_6 to C_{12} aryl radical, n is an integer of from about two to 2000 and x is 1 or 2, and silanes having the formula



wherein R_4 is a C_1 to C_{12} aliphatic radical.

4,551,157

METHOD FOR SEPARATING LIGHT ADDITIVE GAS IN SEPARATING NOZZLE CASCADES

Erwin Becker; Wolfgang Ehrfeld; Wolfgang Fritz, all of Karlsruhe; Harald Steinhaus, Datteln, and Peter Bley, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,287

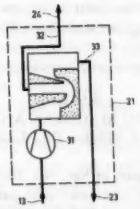
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206821

Int. Cl.[4] B01D *59/18*

U.S. Cl. 55—17 **10 Claims**

1. Process for separating light additive gas at the end of and/or at the location of the change of stage sizes in a separating nozzle cascade operating with a mixture of gaseous or vaporous substances to be separated and a light additive gas, with the separation of the light additive gas being effected by utilizing at least one separating nozzle stage, comprising employing a double deflection separating nozzle stage as the separating nozzle stage for the separation of the light additive gas, wherein the mixture of substances to be separated in the separation of the light additive gas is taken at least at one change of stage size location in the separating nozzle cascade, is separated by the double deflection nozzle into a first partial stream deriched in the light additive gas and a second partial stream enriched in the light additive gas, and the first partial stream is fed into a product side of a section of the separating nozzle cascade at that point where the composition in the first partial stream with respect to the substances to be separated in the separating nozzle cascade and the composition in the separating nozzle cascade section substantially coincide after combination.

6. In a process having an isotope separating cascade for separating a mixture of isotopes and employing light additive gas, and wherein the light additive gas is separated at the end of the isotope separating cascade and/or at the location of the



change of stage sizes in the isotope separating cascade, the isotope separating cascade operating with a mixture of gaseous or vaporous isotope substances to be separated and a light additive gas, with the separation of the light additive gas being effected by utilizing at least one separating nozzle stage, comprising employing a double deflection separating nozzle stage as the separating nozzle stage for the separation of the light additive gas, wherein the mixture of substances to be separated in the separation of the light additive gas is taken at least at one change of stage size location in the isotope separating cascade, is separated by the double deflection apparatus into a first partial stream deriched in the light additive gas and a second partial stream enriched in the light additive gas, and the first partial stream is fed into a product side of a section of the isotope separating cascade at that point where the composition of the mixture of isotopes in the first partial stream and in the isotope separating nozzle cascade section substantially coincide after combination.

4,551,158

REMOVAL OF CO_2 AND/OR H_2S FROM GASES

Eckhart Wagner, Ludwigshafen; Klaus Volkamer, Frankenthal; Werner Hefner, Lampertheim, and Ulrich Wagner, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,867

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308088

Int. Cl.[4] B01D *47/00*

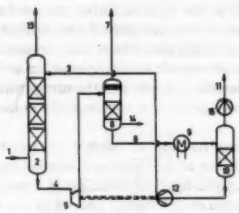
U.S. Cl. 55—46 **4 Claims**

1. A process for removing CO_2 and/or H_2S from a gas containing CO_2 and/or H_2S, which comprises

(a) treating said gas in an absorption stage at from 40° to 100° C. and at a pressure of from 10 to 110 bar with an aqueous absorption liquid containing from 20 to 70% by weight of methyldiethanolamine by feeding in the gas at the bottom and the aqueous absorption liquid at the top of the absorption stage, CO_2 and/or H_2S being washed out by a countercurrent procedure;

(b) taking off the treated gas at the top of the absorption stage;

(c) taking off the aqueous absorption liquid laden with CO_2 and/or H_2S at the bottom of the absorption stage;
(d) regenerating the laden aqueous absorption liquid without the use of a stripping column by flashing it in two or more



flash stages, operating the final flash stage under a pressure of from 0.5 to about 1 bar; and
(e) recycling the regenerated absorption liquid to the absorption stage.

4,551,159

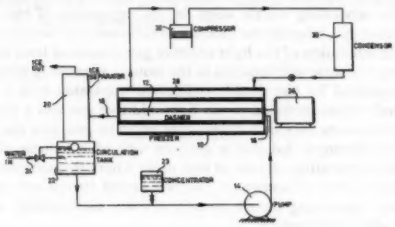
ICE MAKING MACHINE AND METHOD

Vladimir Goldstein, 18 Killaloe Rd., Unit 4, Concord, Ontario, Canada (L4K 1C8)

Continuation-in-part of Ser. No. 26,561, Apr. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 197,553, Oct. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 419,548, Sep. 17, 1982, abandoned. This application Dec. 31, 1984, Ser. No. 687,764

Int. Cl.[4] B01D *9/04;* **C02F** *1/22*

U.S. Cl. 62—541 **15 Claims**



1. A continuous method for making ice in a container having a wall and means for continuously cooling said wall of the container comprising the steps of:
making a solution wherein the solvent is water, the solute is nontoxic and the initial concentration is less than the eutectic concentration;
containing the solution within said container, the solution beingin heat exchange relation with the said wall of the container;
continuously cooling the wall of the container to cool the layer of solution immediately adjacent the side wall below its freezing point with a refrigerant;
continuously moving a blade across and in contact with the wall of the container to carry the cooled layer of mixture at said wall towards the centre of the container;
the rate of movement of the blade across the wall of the container being fast enough to carry the cooled layer of solution at the wall towards the centre of the container as aforesaid before the cooled layer is crystalized into a layer of ice whereby to maintain the temperature of the mixture substantially uniformly throughout the container below its freezing point and form water ice crystals of harvestable size suspended throughout the body of the mixture in the container;
harvesting formed ice crystals from suspension in said solution; and
continuously replenishing said solution in said chamber as said water ice crystals are removed.

4,551,160

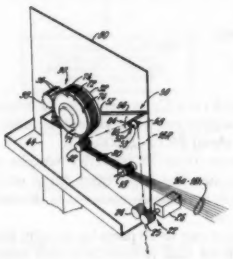
METHOD AND APPARATUS FOR FORMING GLASS FILAMENTS

Richard C. Frailey, and Alex P. Symborski, both of Anderson, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 22, 1984, Ser. No. 663,288

Int. Cl.[4] C03B *37/02;* **D01G** *1/04*

U.S. Cl. 65—2 **13 Claims**



11. A method of producing discrete segments of strands of glass filaments comprising:
supply a plurality of streams of molten glass;
drawing some of said streams into a body of continuous filaments at a first attenuation means;
gathering said body filaments into a plurality of strands;
severing said plurality of strands into discrete segments;
drawing other of said streams into group of continuous filaments at a second attenuation means spaced from said first attenuation means;
gathering said group of filaments into a strand;
positioning said strand associated with said second attenuation means adjacent said first attenuation means;
while maintaining the advancement of said strand by said second advancement means, moving a portion of such strand into contact with said first attenuation means to initiate advancement thereof by the first attenuation means; and
severing said strand associated with the second attenuation means and in contact with the first attenuation means to transfer the attenuation of such strand to the first attenuation means concommittantly with said plurality of strands in the absence of changing the speed of the first attenuation means.

4,551,161

ORGANIC WETTING OF GLASS BATCH

Edward P. Savolskis, North Middleton Township, Cumberland County, and John F. Krumwiede, Indiana Township, Indiana County, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 27, 1984, Ser. No. 624,879

Int. Cl.[4] C03C *1/00;* **C03B** *1/00*

U.S. Cl. 65—27 **20 Claims**

1. A method of melting glass wherein finely divided glass batch materials are wetted with a liquid in sufficient amount to regard dusting of the batch and then fed while in a wetted condition to a melting furnace where the batch is heated until the batch materials become molten, the improvement compris-

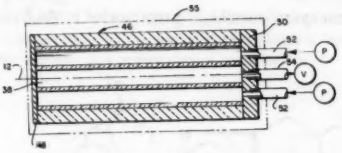
ing wetting the batch prior to being fed to the melting furnace with a wetting agent comprised of an organic liquid.

4,551,162

HOLLOW TUBE METHOD FOR FORMING AN OPTICAL FIBER

John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 1, 1984, Ser. No. 656,260
Int. Cl.⁴ C03B *37/14*
U.S. Cl. 65—4.2 **11 Claims**



1. A method for forming an optical fiber comprising the steps of:

aligning a plurality of hollow elongated starter tubes of optical fiber glass about an axis with each tube engaging adjoining tubes along respective lines of contact;

positioning the aligned starter tubes within the interior of a jacketing tube;

establishing a pressure within the interior of the starter tubes;

plasticizing the starter tubes to cause their tube walls to reform by moving toward and joining to one another and at least portions of the interior of the jacketing tube so as to form a core region along the axis with supporting webs between the core region and the jacketing tube; and

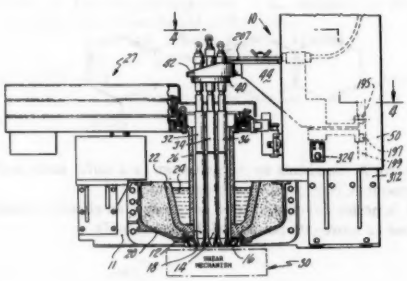
drawing the reformed assembly into an optical fiber.

4,551,163

ELECTRONIC GLASS FEEDER PLUNGER OPERATING MECHANISM

Robert J. Duga, Enfield; Constantine W. Kulig, Windsor; Robert L. Doughty, West Hartford; Robert J. Douglas, North Granby, and Robert P. Andersen, Monroe, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jun. 4, 1984, Ser. No. 616,638
Int. Cl.⁴ C03B *7/08*
U.S. Cl. 65—129 **11 Claims**



1. In a feeder plunger operating mechanism for use with at least one feeder plunger, said feeder plunger attached to a support for being vertically reciprocated relative to a frame, the improvement comprising:

at least one air cylinder attached to said frame, said air cylinder provided with a piston;

a piston rod, one end of said rod being attached to said piston, the other of said rod attached to said support;

means for supplying to said cylinder a predetermined amount of air pressure to urge said piston upwardly with a predetermined counterbalancing force.

2. In a feeder plunger operating mechanism comprising:

a reversible electric motor operatively connected to positively drive at least one plunger in a cyclically reciprocating manner; and

programmable control means operatively connected to said electric motor to cause its output shaft to oscillate between predetermined limits and according to a predetermined cyclical motion profile thereby causing it to move said at least one plunger in a predetermined manner;

a method for starting plunger operation comprising the steps of:

producing a position signal representative of the actual position of said plunger;

producing a varying first position command signal;

comparing said first position command signal to said position signal;

latching said first position command signal to said motor upon a positive comparison between said first position command signal and said position signal;

ramping said first position command signal to a value representative of a predetermined first height in order to move said plunger to said first height;

holding said first position command signal at said value representative of said predetermined first height;

reading from memory a value corresponding to a second height associated with a second position command signal, said second position command signal representative said predetermined cyclical motion profile;

comparing said second height to said first position command signal value representative of said predetermined first height and upon a positive comparison;

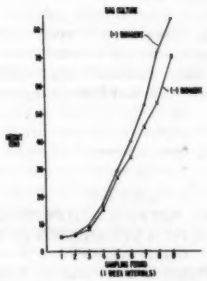
communicating said second position command signal to said motor to drive said plunger according to said predetermined cyclical motion profile.

4,551,164

MICROBIAL PLANT GROWTH PROMOTER

Abraham I. Tenzer, Longwood, Fla., assignor to Bio-Organics, Inc., New York, N.Y.

Filed Oct. 4, 1983, Ser. No. 538,985
Int. Cl.⁴ C05F *11/08*
U.S. Cl. 71—6 **18 Claims**



1. A method for preparing a microbial plant growth promoting composition which comprises growing a bacterial culture in a first nutrient medium under growth conditions to a cell density of from about 2×10^6 to about 10×10^6 cells/ml; growing an algal culture in a second nutrient medium under growth conditions to a cell density of from about 10×10^6 to about 20×10^6 cells/ml, and then mixing the bacterial and algal cultures together and incubating the mixture in a third nutrient medium under growth conditions at a temperature of from about 10° C. to about 40° C. to produce the final product; said

growth conditions including a physiologically acceptable pH and temperature.

4,551,165

MYCORRHIZAL SEED PELLETS

Anne Warner, Harpenden, England, assignor to National Research Development Corporation, England

Filed Apr. 18, 1983, Ser. No. 486,192

Claims priority, application United Kingdom, Apr. 22, 1982, 8211678; Jul. 26, 1982, 8221584

Int. Cl.[4] C05F *11/02*

U.S. Cl. 71—24 **10 Claims**

1. A composition comprising a mixture of vesicular-arbuscular mycorrhizal fungal inoculum, peat adjusted to a pH compatible with growth of the fungus from the inoculum, at least one seed of a plant which is a host for the fungus, and a binder, said composition being in compacted form, and divided into units suitable for sowing.

10. A method of growing a plant from seed, which comprises sowing units of a composition according to claim 1, in a plant growth medium in which the plants can grow under conditions in which they benefit from VA mycorrhizal fungal infection of their root system.

4,551,166

NITROGEN FERTILIZER AND PROCESS FOR ITS MANUFACTURE

Horst Behnke, Obing; Horst Michaud, Trostberg; Joseph Seeholzer, Trostberg, and Svatoplug Solansky, Trostberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,264

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319345

Int. Cl.[4] C05C *9/02*; C05G *3/08*

U.S. Cl. 71—30 **12 Claims**

1. Stable aqueous nitrogen fertilizer composition having a long-term action comprising a suspension of a condensate of a molar excess of urea per mol of formaldehyde, a sufficient amount of dicyandiamide to provide from about 5% to 35% by weight of dicyandiamide-nitrogen, based upon the nitrogen content of the urea, and from 0.001% to 0.5% by weight of a stabilizer comprising a water-soluble polymer selected from the group consisting of polymers of vinyl alcohol and polymers of aldehyde-carboxylic acids, based upon the weight of the suspension, said dicyandiamide being present in said composition in monomeric form and functioning as a nitrification inhibitor.

4,551,167

METHOD OF SOIL NITRIFICATION INHIBITION BY APPLICATION OF A STABILIZED FUMIGANT COMPOSITION

Donald C. Young, Fullerton, and James A. Green, II, Chino, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 20, 1984, Ser. No. 633,014

Int. Cl.[4] C05G *3/08*

U.S. Cl. 71—64.1 **17 Claims**

1. A method for inhibiting nitrification in soil, which comprises applying to the soil a composition comprising an aqueous solution containing a solute which comprises ammonia, hydrogen sulfide, and carbon disulfide, wherein the molarity of hydrogen sulfide is greater than the molarity of carbon disulfide, and is about one-half the molarity of ammonia.

4,551,168

HERBICIDAL 2-(1,3,5-1H-TRIAZIN-2-ONE)-TETRAHYDROBENZOTHIAZOLE DERIVATIVES, AND COMPOSITIONS THEREFOR

Katsumichi Aoki; Takafumi Shida; Satoru Kumazawa; Susumu Shimizu; Yohichi Kanda; Keigo Satake; Shiro Yamazaki; Hiroyasu Shinkawa; Tsuneaki Chida; Hideo Arabori, and Takeo Watanabe, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

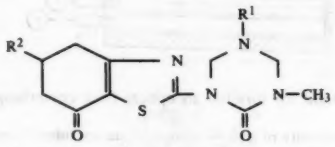
Filed Apr. 5, 1984, Ser. No. 596,928

Claims priority, application Japan, Apr. 8, 1983, 58-61927

Int. Cl.[4] C07D *417/04*; A01N *43/64, 43/78*

U.S. Cl. 71—90 **6 Claims**

1. A tetrahydrobenzothiazole represented by the formula (I):



(I)

wherein R^1 and R^2 represent respectively a straight-chain alkyl group having 1 to 6 carbon atoms or a branched-chain alkyl group having from 3 up to and including 6 carbon atoms.

4,551,169

METAMETHOXY ARYL CARBAMATE DERIVATIVES AND HERBICIDES

Tetsuo Takematsu; Makoto Konnai; Hideo Morinaka, all of Utsunomiya; Yunji Nonaka, and Akira Nakanishi, both of Shinnanyo, all of Japan, assignors to Toyo Soda Manufacturing Company, Limited, Shinnanoyo, Japan

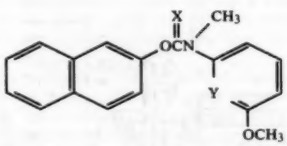
Filed Mar. 17, 1983, Ser. No. 476,313

Claims priority, application Japan, Mar. 17, 1982, 57-40759; Jul. 16, 1982, 57-122921; Sep. 7, 1982, 57-154596

Int. Cl.[4] C07D *213/75*; C07C *125/067*; A01N *47/20, 47/22*

U.S. Cl. 71—94 **4 Claims**

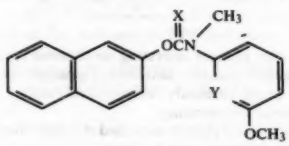
1. Carbamate derivatives represented by the formula (I);



(I)

wherein X represents an oxygen atom or a sulfur atom and Y represents CH group or a nitrogen atom.

4. A herbicidal composition comprising an effective amount of one or more compounds of the formula (I):



wherein X represents an oxygen atom or sulfur atom and Y represents a —CH— group or nitrogen atom.

4,551,170
HERBICIDAL TRIFLUOROMETHYL PYRIDINYLOXYPHENOXY AND PYRIDINYLTHIOPHENOXY PROPANOLS AND DERIVATIVES THEREOF

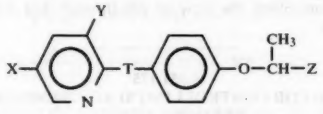
Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 409,791, Aug. 20, 1982, abandoned, which is a division of Ser. No. 918,550, Jun. 23, 1978, , which is a continuation-in-part of Ser. No. 817,943, Jul. 22, 1977, abandoned. This application Dec. 10, 1984, Ser. No. 679,976

Int. Cl.⁴ A01N *43/40;* **C07D** *213/64*

U.S. Cl. 71—94 **12 Claims**

9. The method of controlling undesired plant growth which comprises applying to the locus of said plants a herbicidally effective amount of a compound of the formula



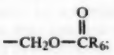
wherein:

T is oxygen or sulfur;

X is Cl, Br or CF_3;

Y is H, Cl, Br or CF_3, provided at least one of X and Y is CF_3;

Z is $—CH_2OR_5$ or



R_5 is H; and

R_6 is C_1–C_7 alkyl.

4,551,171
2-NITRO-5-(SUBSTITUTED-PHENOXY) PHENYLALKANONE OXIME AND IMINE DERIVATIVES AS HERBICIDES

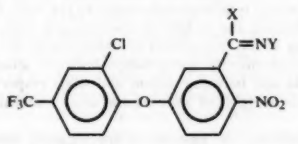
Robert J. Theissen, Bridgewater, N.J., assignor to Rhone-Poulenc, Inc., Monmouth Junction, N.J.

Filed Feb. 1, 1980, Ser. No. 117,731

Int. Cl.⁴ A01N *9/20;* **C07C** *121/75*

U.S. Cl. 71—121 **8 Claims**

1. Herbicidal compounds of the formula:



wherein:

X is selected from the group consisting of hydrogen, alkoxy of 1 to 6 carbons, alkyl of 1 to 6 carbons;

Y is selected from the group consisting of hydroxy, alkali metal oxide selected from the group consisting of —ONa and —OK, alkyl of 1 to 6 carbons.

8. A method for combating undesirable herbs which comprises contacting them with a herbicidally effective amount of a compound defined in claim 1.

4,551,172
PROCESS OF PRODUCING LIQUID CARBON-CONTAINING IRON

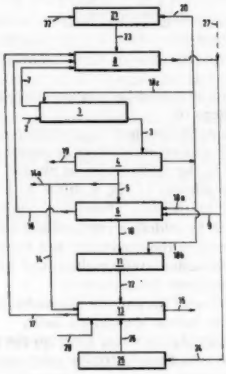
Lothar Formanek, Frankfurt am Main; Martin Hirsch, Friedrichsdorf; Harry Serbent, Hanau am Main; Wolfram Schnabel, Idstein; Klaus-Dietrich Fritzsche, Oberhausen; Heribert Koenig, Duisburg, and Gero Rath, Mülheim, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt and Mannesmann Aktiengesellschaft, Dusseldorf, both of, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,912

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330625; Sep. 22, 1983, 3334221

Int. Cl.⁴ C21C *5/52*

U.S. Cl. 75—11 **8 Claims**



1. In a process of producing liquid carbon-containing iron wherein iron oxide-containing materials are directly reduced with solid carbonaceous reducing agents to form sponge iron, and sponge iron is thereafter melted in an electric reducing furnace, the improvement comprising:

(a) separating the material discharged from the direct reduction by magnetic separation into sponge iron and non-magnetic material containing surplus carbon,

(b) producing electrical energy by afterburning the exhaust gas of the direct reduction,

(c) producing additional electrical energy from hot combustion gases produced in a combustion aggregate,

(d) charging at least part of carbon-containing non-magnetic material obtained according to step (a) into the combustion aggregate according to step (c),

(e) wherein the sponge iron obtained according to step (a) is charged into and melted in the electric reducing furnace into liquid carbon-containing iron and,

(f) wherein the sum of the rate of produced electrical energy according to steps (b) and (c) equals at least the rate of electrical energy necessary for melting the sponge iron to liquid carbon-containing iron according to step (e) and wherein the necessary rate of electrical energy is applied to the electrical reducing furnace.

4,551,173

METHOD FOR ADJUSTING COMPOSITION OF MOLTEN STEEL IN ARC PROCESS

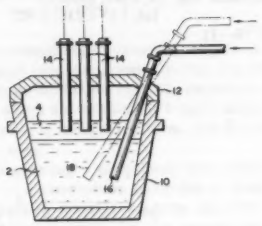
Hirohisa Nakashima; Yoshimi Komatsu; Masafumi Ikeda, and Tsuneo Kondō, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,947

Claims priority, application Japan, Sep. 28, 1984, 59-145887[U]; Sep. 28, 1984, 59-203640; Oct. 11, 1984, 59-213094; Oct. 12, 1984, 59-213334

Int. Cl.[3] C21C *5/52*

U.S. Cl. 75—12 **18 Claims**



1. A method of adjusting the composition of molten steel, comprising the steps of:

pouring molten steel obtained by converter steelmaking into a ladle while adding an additive containing a component to be added to the molten steel as needed;

calculating the amount of the additive to be added to the molten steel in the ladel from the composition of the component to be added, a composition analysis value of the molten steel in the converter, and the amount, if any, of the additive added to the molten steel when the molten steel is poured from the converter;

adding the additive of the amount calculated in said calculating step to the molten steel in the ladle;

submerging electrodes in a slag layer on the molten steel;

supplying power to the electrodes submerged in the slag layer on the molten steel so as to generate an electric arc between the electrodes and the molten steel when the adding of the additive to the molten steel is completed, thereby arc-heating the molten steel; and

introducing a gas in the molten steel through a lance submerged therein, thereby stirring the molten steel.

4,551,174

METHOD OF REFINING MOLTEN STEEL BY ARC PROCESS

Hirohisa Nakashima; Yoshimi Komatsu; Masafumi Ikeda, and Tsuneo Kondo, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,566

Claims priority, application Japan, Sep. 3, 1984, 59-184155; Sep. 28, 1984, 59-1471118[U]; Sep. 28, 1984, 59-203636; Sep. 28, 1984, 59-203637; Sep. 28, 1984, 59-203638

Int. Cl.[4] C21C *5/52*

U.S. Cl. 75—12 **17 Claims**

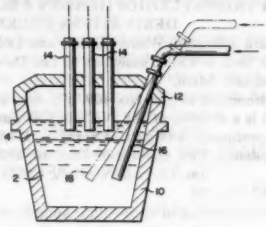
1. A method of refining molten steel by an arc process, comprising the steps of:

flowing molten steel refined by oxidation and having a certain oxygen and carbon content into a ladle at a temperature not higher than 1,650° C.;

submerging an electrode in slag on the nondeoxidized molten steel;

generating an arc between the electrode and the molten steel to arc-heat the molten steel;

introducing a gas which does not react with the molten steel through a lance submerged therein during said arc-heating step, thereby stirring the molten steel and accelerating a chemical reaction between the oxygen and carbon contained in the molten steel; and



avoiding contact between the molten steel and the electrode by controlling the flow of gas through and out of the lance.

4,551,175

METHOD FOR CONTROLLING SLAG CHEMISTRY IN A REFINING VESSEL

Balkishan Agrawal, Ossining, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 17, 1984, Ser. No. 601,286

Int. Cl.[4] C21C *7/00*

U.S. Cl. 75—513 **32 Claims**

1. A process for controlling the slag composition of a metal bath in a refractory lined vessel during the process of refining the bath by the injection of oxygen gas during a period of oxidation and by the injection of nonoxidizing gas or gases during a period of reduction and melt specification adjustment such that the slag at the completion of the refining process will have a composition consisting essentially of A% alumina (Al_2O3), B% silica (SiO_2), C% CaO and D% MgO and a ratio of alumina to silica equal to a value A/B, said process comprising the steps of:

(1) adding aluminum and silicon to the bath as fuel components in a combined proportion of from 0 to 100% Al remainder Si to cause the bath to rise in temperature to a predetermined level upon completion of the period of oxidation and to provide a ratio of alumina to silica which is substantially equal to the value A/B;

(2) establishing the weight of alumina and silica present in the slag at the completion of step 1 from the stoichiometric relationships between aluminum and alumina and between silicon and silica respectively and from the weights of aluminum, alumina, silicon and silica present before the addition;

(3) adding aluminum and silicon to the bath as reductants in a combined proportion of from 0% to 100% aluminum and remainder silicon to cause a substantially complete reduction of the melt and to provide a ratio of alumina to silica which is substantially equal to the ratio A/B;

(4) establishing the weight of alumina and silica present in the slag at the completion of reduction of the bath from the stoichiometric relationships between aluminum and alumina and between silicon and silica respectively and from the weights of alumina and silica established in step (2);

(5) establishing the amount of specification silicon to be added to meet the desired melt specification at the completion of the refining process by multiplying the weight of the metal in the bath by the desired percentage of silicon in the bath at the completion of the refining process;

(6) if the ratio of alumina to silica is equal to the value A/B at the completion of reduction, then adding the amount of silicon established in step (5) to the metal;

(7) if the ratio of alumina to silica from the weights established in step (4) is less than the value A/B at the comple-

tion of reduction, then calculating the proportion of aluminum from 0 to 100% and remainder silicon needed to both meet the silicon specification and attain the ratio of A/B in accordance with the following reaction:

$$4Al + 3SiO_2 \rightarrow 2Al_2O_3 + 3Si$$

(8) adding the aluminum and silicon as required in accordance with step (7) simultaneous with or subsequent to step (3);

(9) establishing the weights of alumina and silica present in the slag at the completion of step (6) or (8) from their stoichiometric relationships with aluminum and silicon; and

(10) adding CaO and MgO to the bath such that the following equations are satisfied:

$$CaO = \frac{C}{A+B} \times (AP_4 + SP_4) - CP$$

$$MgO = \frac{D}{A+B} D \times (AP_4 + SP_4) - MP$$

where AP_4 is the weight of alumina from step (9), SP_4 is the weight of silica from step (9), CP and MP are the weights of CaO and MgO respectively, already in the slag, CaO and MgO are the respective weights of CaO and MgO added in this step and A, B, C and D are the preselected percentages.

4,551,176

RAPIDLY BINDING HIGH-STRENGTH CEMENT BINDING AGENT AND A METHOD OF ITS PREPARATION

Frantisek Skvara, No. 18 Jireckova, Praha 7; Karel Kolar, No. 38 Yostrovska, Praha 6; Zdenek Zadak, No. 733 Na Magistrale, Kolin; Zdenek Friml, No. 543 Rybalkova, Jaromer, and Jaroslav Novotry, No. 13 Nad Sarkou, Praha 6, all of Czechoslovakia

Filed Jun. 16, 1983, Ser. No. 505,238
Int. Cl.[4] C04B *7/35*
U.S. Cl. 106—90 **8 Claims**

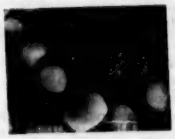
8. Method for production of a rapidly binding high-strength cement binding agent which comprises (1) grinding, in the absence of gypsum, a clinker of a portland cement to the specific surface area 150 to 3000 m^2/kg and to the percent fraction of particles smaller than 5 μm ranging from 5 to 95 weight %, said cement having a dry weight, (2) dissolving (a) from 0.1 to 5 weight % of a water-soluble salt of a sulfomethylated condensation product of phenols to which formaldehyde has been added, wherein said salt includes up to 70% of a trivalent cation selected from the grouup consisting of iron, aluminum and chromium, said condensation product being transferred at least partly into a quinolic form by the action of at least 0.5 weight percent of oxygen based upon 1 weight percent of phenols, and (b) from 0.1 to 10 weight % of a compound selected from the group consisting of an alkaline hydroxide, carbonate, hydrogencarbonate, silicate, hydrogensilicate, hydrogensulfite and oxalate, in formation water, and (3) mixing the ground cement with at least 20 weight % of said formation water, all abovesaid percentages being based on the dry weight of ground cement.

4,551,177

COMPRESSIBLE STARCHES AS BINDERS FOR TABLETS OR CAPSULES

Paolo C. Trubiano, and James J. Kasica, both of Somerville, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 23, 1984, Ser. No. 603,021
Int. Cl.[4] C08B *31/00*; C08L *3/00*
U.S. Cl. 106—210 **20 Claims**



1. A starch, useful as a binder for tablets prepared by direct compression or dry granulation or as a binder-diluent for capsules, which consists essentially of a free-flowing, compressible starch powder derived from a cold-water-insoluble, granular starch base by treatment with an acid, and/or alpha-amylase enzyme, the treatment of the starch base and recovery of the free-flowing, compressible starch powder being carried out at a temperature below the gelatinization temperature of the starch; the treated starch being characterized by altered, weakened non-gelatinized granules with a less dense interior and disrupted surface; the compressible starch powder being capable of forming, under direct compression, a tablet having a hardness of at least 5 kg.

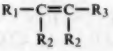
4,551,178

ADDITIVES FOR HOT MIX ASPHALT

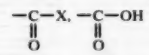
Anthony V. Grossi; Louis T. Hahn, and Alfred Marzocchi, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 7, 1984, Ser. No. 607,892
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—273 N **8 Claims**

1. A method of reclaiming asphalt which comprises mixing reclaimable asphalt with a chemically modified asphalt consisting of a reaction product of unused asphalt, a polymerizable vinyl monomer having the general formula:



wherein R_1 is an aromatic group containing 6 to 12 carbon atoms selected from the group consisting of a phenyl group, a substituted phenyl group wherein the substituent is any one of an amino group, a cyano group, a halogen, a C_1 to C_3 alkoxy group, a C_1 to C_3 alkyl group, a hydroxy group, a nitro group, R_2 is hydrogen or lower alkyl group, and R_3 is hydrogen, a lower alkyl, $—CH_2OH$, —CHO,



or $—CH_2—CH$ and wherein X is a halogen and an alkenyl azabenzene, said chemically-modified asphalt consist of 85–94.5 percent asphalt, 0.5–5 percent azabenzene and 5–10 percent of the vinyl monomer.

4,551,179

COAL-AQUEOUS MIXTURES

Seymour Mark, Northampton, Pa., assignor to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 416,606, Sep. 10, 1982, Pat. No. 4,441,889, which is a continuation-in-part of Ser. No. 230,062, Jan. 29, 1981, Pat. No. 4,358,293. This application Oct. 11, 1983, Ser. No. 540,823

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—277 **2 Claims**

1. A stabilized, high solids content coal-aqueous mixture resulting from the process comprising the steps of:

(i) admixing a polyalkyleneoxide nonionic surfactant having a hydrophobic portion and a hydrophilic portion, said hydrophilic portion being comprised of at least about 100 units of ethylene oxide, with water, under low speed agitation conditions;

(ii) admixing particulate coal with the admixture resulting from step (i) under medium speed agitation conditions; and

(iii) agitating the resultant coal containing mixture of step (ii) under high speed agitation.

4,551,180

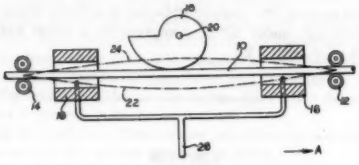
CLEANING ELONGATE STRIP BY DIE IMPACTION

Peter R. Gough, 3 Hopstone Gardens, Penn, Wolverhampton, West Midlands, England

Filed Apr. 11, 1984, Ser. No. 599,001

Int. Cl.[4] B08B *7/02*

U.S. Cl. 134—9 **4 Claims**



1. A method of cleaning an elongate strip while passing the strip through a die which surrounds and is spaced from the strip, by producing repeated lateral impacts between the strip and the surrounding die, comprising the steps of holding the strip under tension on both sides of the die while causing relative lateral vibration of the strip and the die, the amplitude of the vibration being sufficient to produce repeated lateral impacts between the strip and the surrounding die, and displacing material removed by such impacts, by passing a fluid through the die.

4,551,181

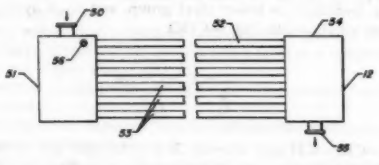
CORROSION PREVENTION AND CLEANING OF AIR-COOLED HEAT EXCHANGERS

William L. Stearman, Jenks, Okla., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 1, 1983, Ser. No. 528,379

Int. Cl.[4] B08B *9/02*

U.S. Cl. 134—22.11 **4 Claims**



1. A method of retarding corrosion in a fin-fan heat exchanger used in cooling vapors comprising hydrocarbons, said exchanger being comprised of a tube-side inlet vapor distribution chamber having at least one inlet nozzle, an outlet header box having at least one outlet nozzle, a plurality of heat exchange tubes having inlet ends in communication with said inlet vapor distribution chamber and having outlet ends in communication with the outlet header box, where said tubes are arranged in a plurality of horizontal rows, each row being located on one of a series of horizontal planes parallel to one another, said exchanger being further comprised of at least one spray conduit for practice of said method having a plurality of treating liquid discharge nozzles, which spray conduit is located perpendicular to said tubes and on a plane parallel to said series of horizontal planes, said method comprising discharging treating liquid from said treating discharge nozzles at a plurality of discharge points inside the inlet vapor distribution chamber, wherein said treating liquid becomes dispersed in droplets in said vapors comprising hydrocarbons which are flowing toward said tube inlet ends, where said discharge points are located no lower than the lowest row of tubes to be treated by said method and are further located adjacent to said tube inlet ends such that paths of vapor flow between said discharge points and said tube inlet ends do not include an abrupt change of direction, thereby permitting said droplets to flow into said tube inlet ends.

4,551,182

PROCESS FOR PRODUCING DEEP-DRAWING COLD ROLLED STEEL SHEETS AND STRIPS

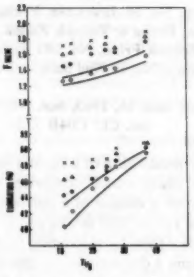
Osamu Akisue; Teruaki Yamada; Shigeru Ueda, all of Hyogo; Yoshikuni Tokunaga, and Masato Yamada, both of Aichi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 418,544, Sep. 15, 1982, abandoned. This application Oct. 27, 1982, Ser. No. 437,027

Claims priority, application Japan, Sep. 18, 1981, 56-147592

Int. Cl.[4] C21D *8/04*

U.S. Cl. 148—12 C **5 Claims**



1. A process for producing deep-drawing cold rolled steel strips, comprising:

hot rolling a steel consisting essentially of 0.0014–0.0031% carbon, 0.010–0.100% aluminum and titanium in amounts not less than 4 times the carbon content, but within a range of from 0.019–0.052%, 0.0019–0.0038% nitrogen with the balance being iron and unavoidable impurities;

coiling the hot rolled strip thus obtained at a temperature not lower than 700° C.; and

subjecting the coiled strip to cold rolling and then continuous annealing including a soaking step in a temperature range of from 700° to 900° C. for 20 seconds to 2 minutes.

4,551,183

METHOD FOR IMPROVING THE STRAIGHTNESS OF ROLLED STEEL

Franz Tamm, Hennigsdorf; Bernhard Höricke, Falkensee; Kurt Welfle; Michael Seidel, both of Hennigsdorf; Wolfgang Tettke, Falkensee, and Karl-Heinz Luckfiel, Hennigsdorf, all of German Democratic Rep., assignors to VEB Stahl-und Walzwerk "Wilhelm Florin", Hennigsdorf, German Democratic Rep.

Continuation-in-part of Ser. No. 538,865, Oct. 4, 1983, abandoned. This application Jul. 31, 1984, Ser. No. 635,963

Claims priority, application German Democratic Rep., Nov. 24, 1982, 2451783

Int. Cl.[4] C21D *7/14*

U.S. Cl. 148—12 R 8 Claims

1. Method for improving the straightness of rolled steel during cooling in one or more steps, prior or subsequent to the finished degree of cooling or prior or subsequent to the last forming process, characterized in that the γ/α-conversion is accelerated or retarded by measured pressure water cooling as compared to the normal process on the cooling bed, depending on the chemical composition of the steel and that in this manner a conversion-related length increase on the cooling bed is prevented in the processed rolling stock.

4,551,184

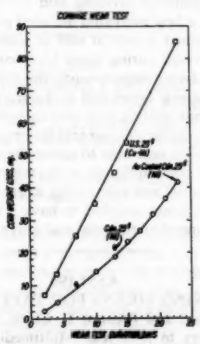
PROCESS FOR OBTAINING A COMPOSITE MATERIAL AND COMPOSITE MATERIAL OBTAINED BY SAID PROCESS

James A. E. Bell; Bruce R. Conard, both of Oakville, and Douglas A. Hope, Mississauga, all of Canada, assignors to Inco Limited, Toronto, Canada

Division of Ser. No. 503,679, Jun. 13, 1983, Pat. No. 4,505,060. This application Nov. 13, 1984, Ser. No. 670,768

Int. Cl.[4] C22F *1/14*

U.S. Cl. 148—127 16 Claims



1. A process for providing a composite coin comprising providing a base having at least a surface of nickel, depositing on said surface of said base a layer of gold at least about 0.1 μm thick and thereafter interdiffusing said gold and said nickel to form a metallurgical bond therebetween and introduce into said gold layer an amount of nickel from said base sufficient to increase the hardness of said gold layer but insufficient to significantly destroy the distinctive color of said gold layer.

4,551,185

METHODS OF AND APPARATUS FOR MAKING RETRACTILE CORDS

Robert P. Loesch, Omaha, Nebr., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Feb. 15, 1983, Ser. No. 466,743

Int. Cl.[4] C21D *1/32*

U.S. Cl. 148—150 4 Claims

1. A method of making retractile cords, said method comprising the steps of:

winding a length of cordage helically in a plurality of convolutions onto a workholder, the wound cordage having leading and trailing end portions which are secured to cause the leading and trailing end portions to be maintained straight and to cause the convolutions to be held on the workholder;

heating and cooling the wound cordage to cause the leading and trailing end portions to be set in a straight configuration;

removing the wound cordage in a manner to reverse the direction of the helices of the convolutions;

severing the length of cordage, which has been wound helically in the plurality of convolutions and which has been heat set in a coiled configuration along its entire length between a straight leading end portion and a straight trailing end portion, said step of severing being accomplished at a predetermined location along the length to form a first retractile cord having the straight leading end portion and a newly formed trailing end portion, and a second retractile cord having the straight trailing end portion and a newly formed leading end portion;

holding the newly formed trailing and leading end portions of the first and second cords in a straight configuration; and

annealing the newly formed trailing end portion of the first cord and the newly formed leading end portion of the second cord to cause each of the newly formed end portions to be retained in a straight configuration which is suitable for termination with a modular plug.

4,551,186

METHOD OF MAKING GAINASP LAYERS FOR PHOTODETECTORS

Gerald Schemmel, Asperg, and Richard Linnebach, Erdmannhausen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 23, 1983, Ser. No. 525,769

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232115

Int. Cl.[4] H01L *21/208*

U.S. Cl. 148—171 5 Claims

1. Method of making $Ga_xIn_{1-x}As_yP_{1-y}$ layers for photodetectors wherein the Ga and As components are chosen so that, during the growth of the layer on an InP substrate, the crystal lattices at the layer-substrate junction match, and the energy gap lies in the range between 0.905 eV and 0.875 eV, characterized by,

contacting a melt consisting of a ternary solution of GaAs and InAs in indium and having the proper percentages of Ga and As with a first InP substrate at a first temperature for a few hours and then separating the melt from the substrate to obtain the proper quaternary composition of the starting material,

growing the layer by contacting a second InP substrate with the quaternary melt at a second temperature,

the first temperature being a constant temperature lying slightly above the temperature at which the layer is grown, and the second temperature being a temperature lying clearly above 640° C.

4,551,187

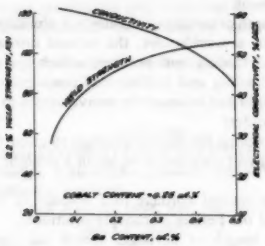
COPPER ALLOY

Nathan L. Church, Chagrin Falls; W. Raymond Cribb, Mentor, and John C. Harkness, Lakewood, all of Ohio, assignors to Brush Wellman Inc., Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,528

Int. Cl.⁴ C22C *9/06*; C22F *1/08*

U.S. Cl. 148—411 **2 Claims**



1. A copper-beryllium alloy consisting essentially of about 0.2% to about 0.5% beryllium, about 0.2% to about 0.5% cobalt and the balance essentially copper which has been solution treated at a temperature not exceeding about 1750° F., then cold worked at least about 70% and aged in the temperature range of about 700° F. to about 800° F. for about 1 to about 5 hours and which has a Percent Remaining Stress of at least about 85% after 1000 hours of stress relaxation testing at 300° F. at an initial stress of 75% of the 0.2% offset yield strength, a formability not exceeding 1.25 in the longitudinal bend test, a tensile strength of about 95 to about 125 ksi (655 to 860 MPa), 0.2% offset yield strength of about 85 to about 120 ksi (580 to 825 MPa), elongations of about 5% to about b 15% and conductivity of about 40% to about 65% I.A.C.S. and by a microstructure, in the condition resulting from an anneal at 1650° F. followed by an age at 950° F., exhibiting a particle density of the principal hardening precipitates of about 2.3×10^9 precipitates per square millimeter in a transmission electron microscope thin foil, and only about 240 cobalt-beryllium intermetallic particles of at least 2.5 microns diameter per square millimeter in an optical metallograph.

4,551,188

DEVICE FOR LIFTING THE FLAPS OF LETTERS OR ENVELOPES

Wolfgang Schulze, Berlin, Fed. Rep. of Germany, assignor to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany

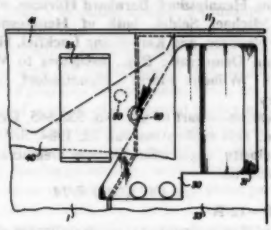
Filed Oct. 15, 1984, Ser. No. 661,244

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337488

Int. Cl.⁴ B65B *9/08*

U.S. Cl. 156—441.5 **5 Claims**

1. An envelope or letter closing device of a postal article processing machine, comprising a moistening device having a holding plate, a feeder mechanism disposed upstream of said moistening device in travel direction of the letters or envelopes for feeding the letters or envelopes to said moistening device, and a device for lifting the flaps of the envelopes or letters, said lifting device including a compressed air issuing device with an outlet opening, and a sensing device disposed in said feeder mechanism and connected to said compressed air issuing device, said sensing device causing said compressed air issuing device to issue an air stream from said outlet opening upon sensing letters or envelopes passing by for lifting the flaps of



unsealed envelopes or letters and conducting the flaps below said holding plate for moistening.

4,551,189

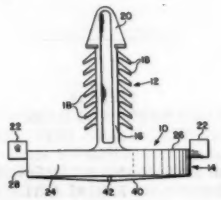
FRICTION WELDED FASTENER SYSTEM

Francis C. Peterson, Woodbury, Conn., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 12, 1984, Ser. No. 681,040

Int. Cl.⁴ B29C *27/08*

U.S. Cl. 156—73.5 **3 Claims**



1. A friction welding fastener system for fusing to a substrate by heat of friction induced by the application of rotative and axial forces applied to the fastener, comprising a base member of a thermoplastic material having an insufficient bonding affinity to said substrate to produce adequate adhesion between the bottom surface of said base and said substrate, a cavity formed inwardly of said bottom surface, an integral wall of thermoplastic material dividing said cavity into at least two compartments, a heat activated uncured polymeric resin material layer contained in one of said at least two compartments and a heat activated curing agent layer contained in the other of said at least two compartments, the thickness of said polymeric resin material layer and said curing agent layer being selected to permit contact with said substrate as said fastener is rotated, and means for driving said fastener to provide rotative and axial forces on said base to cause the melting of a portion of said integral wall sufficient to permit mixing of said polymeric resin material and said curing agent, the resulting cured polymeric resin being selected to have a bonding affinity for both said base member material and said substrate material.

4,551,190

ALIGNING MEANS FOR TAPE SPLICER

Robert I. Farrow, and Richard L. Clark, both of Burlington, N.C., assignors to American Multimedia, Inc., Burlington, N.C.

Continuation of Ser. No. 540,071, Oct. 7, 1983, Pat. No. 4,475,970. This application Jul. 6, 1984, Ser. No. 628,441

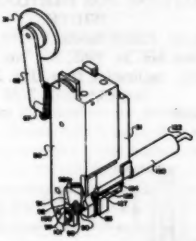
The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.

Int. Cl.⁴ B31F *5/00*; B65H *19/00*; B32B *31/00*; B65C *9/08*

U.S. Cl. 156—159 **12 Claims**

1. An apparatus for feeding and applying splicing tape to two adjacent tape ends positioned on a splice bed, comprising:

(a) a splicing tape applicator wheel mounted for rotation and having a plurality of peripheral faces, each face defining a splicing tape carrying surface;
(b) a source of splicing tape for being applied to successive tape carrying surfaces;
(c) movement means for moving a tape carrying surface of said applicator wheel into and out of contact with the two tape ends to be spliced and applying a length of splicing tape thereto;
(d) motion converting means cooperating with said movement means and said applicator wheel for converting movement of said applicator wheel into unison rotation of said applicator wheel thereby moving a next successive tape carrying surface into position for application of the splicing tape during the next movement;
(e) aligning means cooperating with said applicator wheel



and said motion converting means for aligning successive surfaces of said applicator wheel in proper alignment with the splice bed after each application of splicing tape and before the next, said alignment means including stop means cooperating with said motion converting means to stop the rotational movement of said applicator wheel and a stop means engagement member mounted for unison movement with said applicator wheel and positioned to engage said stop means at the termination of each upward movement of said applicator wheel to reposition successive sides of said applicator wheel in preparation of the next downward movement thereof into tape-applying position, and wherein said stop means engagement member comprises a body having a plurality of discreet outwardly projecting shoulders, at least one of said shoulders adapted to engage said stop means and thereby align said applicator wheel.

4,551,191

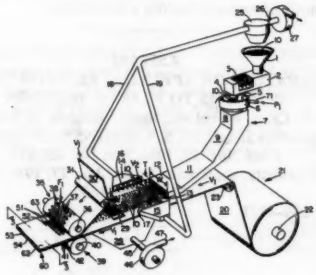
METHOD FOR UNIFORMLY DISTRIBUTING DISCRETE PARTICLES ON A MOVING POROUS WEB

Ronald W. Kock, and John A. Esposito, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 29, 1984, Ser. No. 625,932
Int. Cl.[4] B29F *3/00*
U.S. Cl. 156—276 **50 Claims**

1. A method for substantially uniformly distributing a layer of discrete particles along a predetermined portion of the uppermost surface of a moving porous web traveling at a first velocity so that said particles occupy less than 100% of said predetermined portion of the uppermost surface of said moving web, said method comprising the steps of:
(a) entraining said particles in a moving gaseous stream;
(b) passing said gaseous stream through a conduit having a nozzle exit positioned adjacent the uppermost surface of and oriented so as to discharge said gaseous stream containing said entrained particles in a direction substantially parallel to the direction of travel of said moving porous web;
(c) mixing said particles entrained in said gaseous stream inside said conduit to provide a substantially uniform distribution of said particles, as measured across the width of said nozzle exit of said conduit in a direction perpendicular to the direction of travel of said moving porous web;
(d) discharging said gaseous stream containing said uniformly distributed entrained particles from said conduit adjacent said predetermined portion of the uppermost surface of said moving porous web at a second velocity; and
(e) maintaining the fluid pressure adjacent the lowermost surface of said moving porous web at a level below the fluid pressure adjacent the uppermost surface of said moving porous web in an area coinciding in width to said predetermined portion of said web and located near the nozzle exit of said conduit, whereby the uniformly distributed particles entrained in said discharged gaseous stream are substantially uniformly deposited on said predetermined portion of the uppermost surface of said moving porous web as the bulk of the gas in said gaseous stream is drawn from the uppermost to the lowermost surface of said web.

41. An apparatus for substantially uniformly distributing a layer of discrete particles along a predetermined portion of the uppermost surface of a moving porous web traveling at a first velocity so that said particles occupy less than 100% of said predetermined portion of the uppermost surface of said moving web, said apparatus comprising:
(a) means for feeding said particles in a substantially uniform stream to the inlet of a gas eductor;
(b) means for entraining said particles in a moving gaseous stream;



(c) conduit means for passing said gaseous stream through a nozzle exit positioned adjacent the uppermost surface of and oriented so as to discharge said gaseous stream containing said entrained particles in a direction substantially parallel to the direction of travel of said moving porous web;
(d) means for mixing said particles entrained in said gaseous stream inside said conduit to provide a substantially uniform distribution of said particles, as measured across the width of said nozzle exit of said conduit in a direction perpendicular to the direction of travel of said moving porous web;
(e) nozzle exit means at the discharge end of said conduit means for discharging said gaseous stream containing said uniformly distributed entrained particles from said conduit adjacent said predetermined portion of the uppermost surface of said moving porous web at a second velocity which is greater than said first velocity; and
(f) means for maintaining the fluid pressure adjacent the lowermost surface of said moving porous web at a level below the fluid pressure adjacent the uppermost surface of said moving porous web in an area coinciding in width to said predetermined portion of said web and located near the nozzle exit of said conduit, whereby the uniformly distributed particles entrained in said discharged gaseous stream are substantially uniformly deposited on said pre-

determined portion of the uppermost surface of said moving porous web as the bulk of the gas in said gaseous stream is drawn from the uppermost to the lowermost surface of said web.

4,551,192

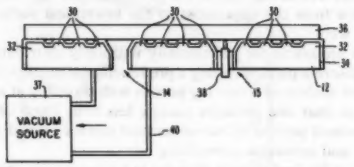
ELECTROSTATIC OR VACUUM PINCHUCK FORMED WITH MICROCIRCUIT LITHOGRAPHY

Vincent Di Milia, Pleasantville; Juan R. Maldonado, Chappaqua; James L. Speidell, Carmel, all of N.Y., and John M. Warlaumont, Ridgewood, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,738

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—345 **30 Claims**



1. In a pinchuck of the type wherein pins extend from and are supported by a base, said pins having flat top surfaces all lying in a common plane, the improvement wherein said base and pins are of unitary construction formed by etching from a single block of material having a flat surface.

4,551,193

APPARATUS FOR APPLYING REINFORCEMENT BOTTOMS TO PLASTIC BOTTLES

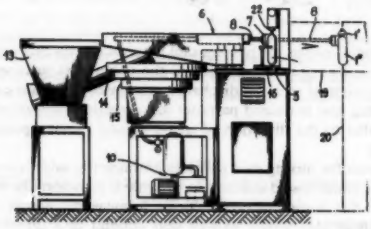
Manuel I. Cano, Barcelona, Spain, assignor to Ensamblaje y Manipulacion Industrial, S.A. (EMINSA), Barcelona, Spain

Filed Nov. 10, 1983, Ser. No. 550,695

Claims priority, application Spain, Jan. 27, 1983, 519328

Int. Cl.[4] B29D *3/00*

U.S. Cl. 156—423 **5 Claims**



1. An apparatus for applying bottom cups to blow molded, hollow plastic containers having injection molded necks comprising

means for transferring a plurality of the containers substantially simultaneously from a molding device to a first station, said means for transferring including suction means for individually engaging the exterior or each container and holding each container in a predetermined orientation at said first station,

means for applying adhesive to bottom cups and means for feeding a plurality of said cups to said first station with each cup aligned with a container so as to receive the bottom of a container therein,

means for moving a plurality of the aligned cups toward the bottoms of the containers and to press a respective cup against a respective bottom of a container, and means for supplying a gas under pressure to the interior of each container while the cups are being pressed against the container bottoms,

said means for transferring being operative to then release the containers whereby the containers are transferred to said means for feeding which operates to discharge the containers from said apparatus.

4,551,194

TAPING MACHINE FOR CARTONS OF VARIABLE WIDTH

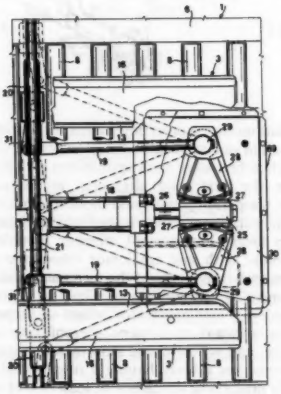
Augusto Marchetti, Piazza Sicilia, 7 - 20146 Milano, Italy

Filed Jan. 24, 1985, Ser. No. 694,630

Claims priority, application Italy, Jan. 26, 1984, 19326 A/84

Int. Cl.[4] B65B *7/16*

U.S. Cl. 156—468 **4 Claims**

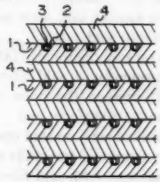


1. Taping machine for cartons of variable width, comprising a carton support base and a pair of driven-belt conveying units mounted on said support base and mutually approachable from opposite sides to perform a conveying engagement with the carton sides, characterized in that said conveying units are mounted on said support base at their outlet ends and at portions advanced with respect to their inlet ends, said outlet ends being rotatably mounted on respective belt driving shafts, which vertically project from conical groups for motion transmission, which are slidingly mounted on a horizontal driving shaft extending transversally with respect to said support base, and said advanced portions being fixed to respective support sleeves slidingly mounted on at least one transversal guiding bar, and there is provided a displacing device for the conveying units, which is arranged at the inlet ends of said units and comprises a slidable body with horizontal axis and rack-shaped opposite sides, control means for the sliding of said body, a pair of toothed sectors rotatable about vertical axes and engaged with said rack-shaped sides of said body to transform the horizontal sliding of the latter into corresponding rotations of said toothed sectors, and kinematic connecting means which extend horizontally along said support base to connect kinematically said toothed sectors to said sliding sleeves in order to convert said opposite rotations of said toothed sectors into a corresponding movement of mutual approach or moving away of said conveying units.

4,551,195
METHOD FOR GROWING BORON NITRIDE CRYSTALS OF CUBIC SYSTEM

Eiichi Iizuka; Tomoji Sando; Shinji Kashima, and Masakazu Maki, all of Shiojiri, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1984, Ser. No. 654,293
Int. Cl.[4] C30B *29/38*
U.S. Cl. 156—603 **7 Claims**



1. An improvement in a method for growing boron nitride crystals of the cubic system which comprises subjecting reaction materials of low pressure phase boron nitride, a solvent material, and cubic boron nitride particles as the seeds, to pressure and temperature conditions in the cubic boron nitride-stable region, wherein the reaction materials are in the form of a pair of a superimposed solvent material plate and a low pressure phase boron nitride plate or a pile made of a plurality of said pairs of the superimposed solvent material plate and low pressure phase boron nitride plate, a plurality of the seed particles being disposed on either one or each of the confronting surfaces of the pair of the superimposed solvent material plate and low pressure phase boron nitride plate; or the reaction materials are in the form of a plate made of a mixture of the solvent material and the low pressure phase boron nitride or a pile made of a plurality of the solvent material/low pressure phase boron nitride mixture plates, a plurality of the seed particles being disposed on a surface of each solvent material/low pressure phase boron nitride mixture plate,

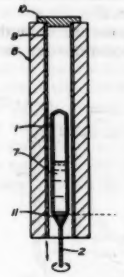
said improvement comprising regularly disposing the seed particles having a particle size of not larger than 150 μm in such a manner that the seed particles are located at a substantially equal distance and the distance between the peripheries of every two adjacent grown cubic boron nitride crystal particles is in the range of 20 to 200 μm; and allowing the cubic boron nitride crystals to grow until their sizes reach at least 1.5 times the size of the seed particles.

4,551,196
METHOD OF GROWING CRYSTALLINE CADMIUM MERCURY TELLURIDE AND CRYSTALLINE CADMIUM MERCURY TELLURIDE GROWN BY THE METHOD

Peter Capper, and John J. Gosney, both of Southampton, England, assignors to U.S. Philips Corporation, New York, N.Y.

PCT No. PCT/GB82/00148, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/04073, PCT Pub. Date Nov. 25, 1982
PCT Filed May 14, 1982, Ser. No. 433,131
Claims priority, application United Kingdom, May 15, 1981, 8114911
Int. Cl.[4] C30B *21/02*
U.S. Cl. 156—616 R **4 Claims**

1. A method of growing crystalline cadmium mercury telluride, the method comprising the steps of preparing a melt of cadmium mercury telluride in a sealed ampule and growing the crystalline cadmium mercury telluride from the melt by a vertical Bridgman process, characterized in that the crystalline cadmium mercury telluride is grown at the rate of from 0.1 to 2 mm per hour, and that during growing of the cadmium mercury telluride crystal said ampule is subjected to the following accelerated ampule rotation program:



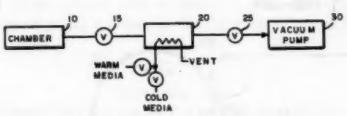
Direction	Acceln. period	Constant 10–100 rmp	Deceln. period
Clockwise	1 to 20 s	1 to 360 s	1 to 20 s
Stop		1 to 45 s	
Anti-Clockwise	1 to 20 s	1 to 360 s	1 to 20 s
Stop		1 to 45 s	

the rotation of said ampule being around its longitudinal axis.

4,551,197
METHOD AND APPARATUS FOR THE RECOVERY AND RECYCLING OF CONDENSABLE GAS REACTANTS

Joseph G. Guilmette, 38 Rice Rd., and Robert C. Wright, 307 Main St., both of Hingham, Mass. 02043

Filed Jul. 26, 1984, Ser. No. 634,635
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*
U.S. Cl. 156—642 **20 Claims**



1. A method for the recovery and recycling of noble gas halides comprising:

reacting a noble gas halide with a substrate in a reaction chamber;

condensing unreacted noble gas halide on a cold surface;

pumping away the remaining reaction products;

warming the cold surface; and

readmitting the noble gas halide obtained from the cold surface into the reaction chamber.

4,551,198
METHOD OF FLASHING BLACK LIQUOR

William E. Wiley, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Division of Ser. No. 363,522, Mar. 30, 1982,. This application Mar. 22, 1984, Ser. No. 592,062
Int. Cl.[4] B01D *1/16*
U.S. Cl. 159—47.3 **9 Claims**

1. A method of flashing steam in a vertically disposed flash tank having a black liquor from a pulping process inlet at a central portion of the flash tank, a steam outlet, and a liquid outlet, and sidewalls, comprising the steps of:

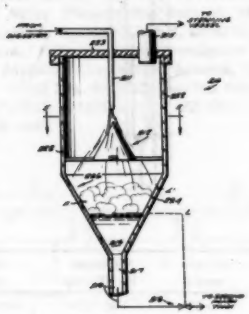
(a) continuously feeding black liquor from a pulping process

under pressure downwardly into the flash tank through the centrally located inlet;

(b) in the flash tank, reducing the pressure acting on the downwardly directed black liquor so that steam and liquid are generated thereby;

(c) removing the generated steam through the steam outlet;

(d) removing the liquid through the liquid outlet;



(e) maintaining a seal adjacent the liquid outlet so that steam passes through the liquid outlet with the liquid; and

(f) deflecting the downwardly directed central feed of black liquor interiorly of the flash tank so that it hits the sidewalls of the tank and has minimum momentum loss due to deflecting action so that the density of foam formed in the flash tank is maximized.

4,551,199

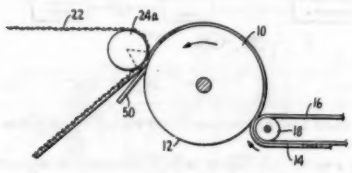
APPARATUS AND PROCESS FOR TREATING WEB MATERIAL

Scott B. Weldon, San Mateo, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jul. 1, 1982, Ser. No. 394,208

Int. Cl.[4] D21H *5/24*

U.S. Cl. 162—109 **14 Claims**



1. A process of treating fibrous web material comprising the steps of:

applying said web to the outer, cylindrically-shaped generally smooth transport surface of a rotating member at a predetermined first location;

positioning an open mesh fabric pick-up member including web locking fabric filaments defining voids at a predetermined second location whereat a surface of said open mesh fabric pick-up member is closely adjacent to said transport surface;

transporting said web on said transport surface between said first and second locations at a predetermined transport surface speed;

driving said open mesh fabric pick-up member so that it has a relative velocity differing from that of said transport surface whereby a differential relative velocity nip is defined thereby at said predetermined second location;

passing said web between said open mesh fabric pick-up member and said transport surface through said differential relative velocity nip;

at said nip, bringing said web into engagement with said fabric filaments;

decelerating said web and moving said web on and relative to said generally smooth transport surface with said fabric filaments thereby causing said web to accumulate and bulk at said nip;

transferring said accumulated and bulked web to said open mesh fabric pick-up member substantially simultaneously with passage of said web between the open mesh fabric pick-up member and transport surface by pressing said transport surface against said web and impressing a portion of said web into said voids;

retaining said web on said open mesh fabric pick-up member in locking engagement with said fabric filaments after the web has passed between the open mesh fabric pick-up member and transport surface; and

transporting said bulked web on said open mesh fabric pick-up member away from said transport surface with the web in locking engagement with said fabric filaments.

4,551,200

PAPER SIZING COMPOSITION AND METHOD

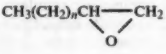
Gordon G. Cash, Asheville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Jul. 10, 1984, Ser. No. 629,517

Int. Cl.[4] D21H *1/34*

U.S. Cl. 162—135 **18 Claims**

1. A method for sizing cellulosic fiber-containing paper comprising reacting said paper at a pH of from about 11 to about 14 in the presence of tetrabutylammonium hydroxide with an amount of a sizing agent at a temperature of at least about 100° C. and for a time sufficient to impart hydrophobicity to said paper, said tetrabutylammonium hydroxide being present in an amount sufficient to promote said reaction, said sizing agent having the formula:



or a hydrophobic substituted derivative thereof wherein n is an integer from 12 to 24.

4,551,201

PAPER SIZING COMPOSITION AND METHOD

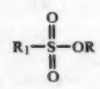
Gordon G. Cash, Asheville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Jul. 10, 1984, Ser. No. 629,516

Int. Cl.[4] D21H *3/16*

U.S. Cl. 162—158 **21 Claims**

1. A method for sizing cellulose fibers or cellulose fiber-containing material comprising reacting said cellulose fibers with an amount of a sizing agent and for a time sufficient to render said cellulose fibers hydrophobic, said sizing agent having the formula:



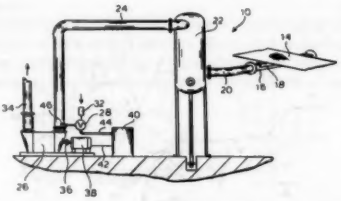
wherein:

R_1 is an alkyl group having from 1 to 5 carbon atoms, and R is an alkyl group having from 12 to 24 carbon atoms.

4,551,202
VACUUM CONTROL SYSTEM AND METHOD FOR DEWATERING FABRICS

Joseph A. Bolton, Queensbury, and David J. Sallis, Glens Falls, both of N.Y., assignors to Albany International Corporation, Menands, N.Y.

Filed Jan. 31, 1984, Ser. No. 575,447
Int. Cl.⁴ D21F *1/48*
U.S. Cl. 162—198 **13 Claims**



1. In a vacuum control system for dewatering a press fabric on a papermaking machine including a suction pipe, a centrifugal exhauster connected to the suction pipe to provide a desired vacuum level to the fabric passing over a slot in the suction pipe so that suction applied therethrough will dewater the fabric, the improvement comprising: control means which includes a variable speed drive means connected to the centrifugal exhauster coupled to the suction pipe, said control means being responsive to a change in the air flow in the suction pipe as fabric permeability decreases and air flow demand decreases to correspondingly raise the speed of the variable speed drive means and accordingly the centrifugal exhauster while the drive load of the drive means remains substantially the same so as to increase vacuum level in the suction pipe as a function of the decrease in fabric permeability and air flow demand.

8. A method of controlling vacuum conditions in a papermaking machine at the suction box section thereof which includes a centrifugal exhauster connected to a suction pipe to supply a desired vacuum level in the suction pipe so that suction applied therethrough will dewater a fabric passing over the suction pipe, the improvement steps comprising: driving the centrifugal exhauster by a variable speed drive motor; adjusting the speed of the centrifugal exhauster through a controller connected to the drive motor which is automatically responsive to a change in the air flow in the suction pipe as fabric permeability decreases and air flow demand decreases to correspondingly raise the speed of the drive motor and according the centrifugal exhauster while the drive load of the drive motor remains substantially the same and increase the vacuum level in the suction pipe as a function of the decrease in fabric permeability and air flow demand.

4,551,203
METHOD AND ARRANGEMENT FOR GUIDING A PAPER WEB FROM THE PRESS SECTION TO THE DRYING SECTION

Pekka Eskelinen, Turku, Finland, assignor to Valmet Oy, Finland

Filed Apr. 2, 1984, Ser. No. 595,969
Int. Cl.⁴ D21F *11/00, 3/00, 5/00*
U.S. Cl. 162—202 **18 Claims**

1. Apparatus for guiding a fibrous web from a press section to a drying section, comprising

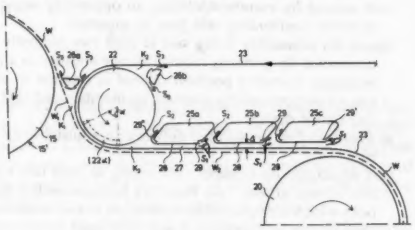
a guide roll adapted to guide the web passing from the press section onto a drying wire from the drying section passing about said guide roll, and

means for urging the web and drying wire against one another as the web is passed to the drying section, said urging means disposed between said guide roll and the drying section in a running direction of the web and wire,

said guide roll constituting means for passing the web in an open draw from the press section onto the drying wire, and

said urging means comprising means for generating a negative pressure in a space adjacent a side of the drying wire opposite a side contacting the web, to urge the web and drying wire against each other, and

said negative pressure generating means comprising at least one blowing box having gas discharge means extending substantially over an entire width of the web, said blowing box directing a gas stream through said gas discharge means in a direction substantially parallel to the running direction of the web and supporting drying wire, and at a speed greater than a running speed of the drying wire, to create negative pressure between the blowing box and the



drying wire to thereby urge the web and drying wire against one another.

13. A method for guiding a fibrous web from a press section to a drying section, comprising the steps of

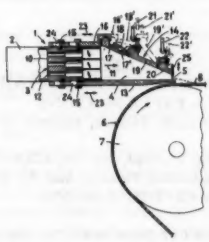
passing the web from the press section in an open draw onto a drying wire passing about a guide roll, and

urging the web and drying wire against each other as the drying wire passes from the guide roll to the drying section by ejecting gas out of blowing means on a side of the drying wire opposite a side supporting the web in a direction substantially parallel to a running direction of the drying wire and web and at a speed greater than a running speed of the drying wire in order to generate negative pressure in a space between the blowing means and the drying wire.

4,551,204
HEADBOX FOR A PAPERMAKING MACHINE

Herbert Holik, Ravensburg, and Rüdiger Kurtz, Immenstaad, both of Fed. Rep. of Germany, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jun. 4, 1984, Ser. No. 617,180
Claims priority, application Switzerland, Jun. 9, 1983, 3157/83
Int. Cl.⁴ D21F *1/00*
U.S. Cl. 162—336 **12 Claims**



1. A headbox for a papermaking machine having a predetermined operating width, comprising:

an infeed means for a fiber stock suspension;
said fiber stock suspension having a predetermined direction of flow;
a stock distributor device rheologically connected to said infeed means;
a nozzle channel rheologically connected subsequent to said stock distributor device as viewed in said predetermined direction of flow;
a first lip member and a second lip member conjointly delimiting a slice opening extending over said predetermined operating width;
said nozzle channel being formed between said first lip member and said second lip member;
at least said first lip member comprising at least two hingedly interconnected lip portions arranged successively in said predetermined direction of flow;
said second lip member defining an oppositely situated lip member confronting said first lip member;
means for adjustably fixing said at least two hingedly interconnected lip portions relative to one another in a predetermined operative position thereof in relation to at least one of said oppositely situated lip member and said stock distributor device;
at least said first lip member defining an adjustable lip member;
said adjustable lip member comprising at least one lip portion of said at least two hingedly interconnected lip portions which is displaceably connected to said stock distributor device in correspondence with said predetermined direction of flow;
said adjustable lip member comprising at least one further lip portion of said at least two hingedly interconnected lip portions which at least partially delimits said slice opening;
said at least one further lip portion having a downstream end;
said at least one further lip portion being provided at said downstream end thereof with a diaphragm adjustable in relation to said oppositely situated lip member in a direction substantially transverse to said predetermined direction of flow and adapted to form a substantially planar free jet of said fiber stock suspension;
at least one lip portion of said at least two hingedly interconnected lip portions defining an upstream lip portion situated adjacent said at least one further lip portion in an upstream direction as viewed in said predetermined direction of flow;
said at least one further lip portion and said upstream lip portion mutually defining a hinged connecting location;
said hinged connecting location being arranged in immediate proximity to said diaphragm;
adjustment means for pivotably adjusting said diaphragm about said hinged connecting location through an angle of inclination in relation to said oppositely situated lip member which is predetermined independently of the momentary position of said upstream lip portion; and
said adjustment means further permitting adjusting said upstream lip portion independently of the momentary position of said diaphragm in relation to said stock distributor device.

4,551,205

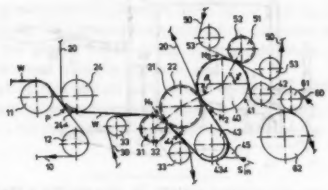
PRESS SECTION WITHOUT PRESS SUCTION ROLLERS IN A PAPER MACHINE

Jorma Laapotti, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Aug. 17, 1983, Ser. No. 523,974
Claims priority, application Finland, Aug. 24, 1982, 822933
Int. Cl.⁴ D21F *3/04, 3/08*
U.S. Cl. 162—360.1 **14 Claims**

1. In a press section of a paper machine, said press section having a pick-up roller for conducting a paper web coming from a wire section to said press section, a first two-fabric press nip, and a first topside fabric supporting the paper web at least through said first two-fabric press nip and serving as a pick-up fabric in conjunction with said pick-up roller, and

said press section having at least three press rollers in closed roll combination defining press nips with each other, a first two of said press rollers in the direction of travel of the web having solid recessed surfaces, a third one of said press rollers being a smooth-surface central roller of said press section, said first and second press rollers defining said first press nip, a second press nip defined by said second press roller and by said third press roller, a second fabric serving as a press fabric at least in said first press nip,



the web being conducted to said second press nip through said first press nip interposed between said first and second fabrics and through said second nip while being supported by one of said first and second fabrics, the improvement comprising

a return roller separate from said second press roller and located between said first and second press nips; and

means in conjunction with said return roller for maintaining the web in contact with the fabric supporting the web on a sector of said return roller lapped by one of said first and second fabrics and the web thereby supported, wherein

said press section having the closed roll combination defining the press nips is devoid of press nips formed with rollers of the suction type.

4,551,206

APPARATUS WITH MOVING BED PRESSURE LETDOWN STAGE FOR RECOVERING RETORTED OIL SHALE

Roland F. Deering, Brea, and John H. Duir, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 451,597, Dec. 20, 1982, Pat. No. 4,435,271, and a continuation-in-part of Ser. No. 400,273, Jul. 22, 1982, Pat. No. 4,461,673. This application Jan. 4, 1984, Ser. No. 568,108
Int. Cl.⁴ C10B *33/00*
U.S. Cl. 202—99 **8 Claims**

1. An apparatus for depressurizing a gravitating bed of retorted hydrocarbon-bearing shale particulates produced from an oil shale retort, said apparatus comprising in fluid-tight arrangement:

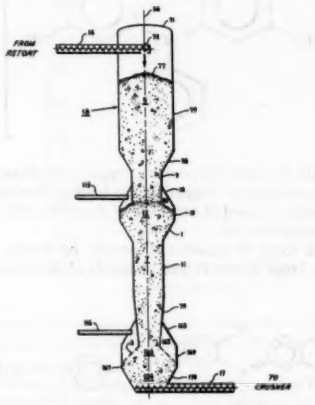
(a) means defining a surge chamber connected to said retort to receive a gravitating bed of shale particles from said retort, the lower portion of said surge chamber means being a downwardly converging truncated cone;

(b) means defining a gas injection chamber located below and connected to said surge chamber means to receive said gravitating particle bed from said surge chamber means and to inject gas into the body of said particle bed as said particle bed gravitates through said gas injection chamber means, said gas injection chamber means comprising (1) a first substantially cylindrical conduit fluid-tightly joined at its upper end to the lower end of said converging truncated cone, and its lower end terminating in an opening allowing for the gravitating particle bed to assume a free surface lying at its natural angle of repose from said opening, (2) a downwardly diverging truncated cone, the smaller, upper end of said diverging truncated

cone being fluid-tightly mated to the exterior of said first cylindrical conduit at a distance above the lower end of said cylinder, (3) a second substantially cylindrical conduit fluid-tightly joined at its top to the lower end of said diverging truncated cone and extending below the point at which the surface of the gravitating particle bed, lying at its natural angle of repose and extending from said opening of said first cylindrical conduit, meets the inside surface of said second cylindrical conduit;

(c) means for delivering a controlled flow of gas to said gravitating particle bed within said gas injection chamber means;

(d) pressure control means operably connected to the upper region of said surge chamber means and to said gas injection chamber means for maintaining said surge chamber means at a pressure greater than the pressure of said retort;



(e) means defining a seal leg chamber of a length to cross sectional area ratio of at least about three feet per square foot located below and connected to said gas injection chamber means to receive said gravitating particle bed from said gas injection chamber means, the configuration of said seal leg chamber means being such as to provide a resistance to downwardly directed gas flow through said particle bed as said particle bed gravitates through said seal leg chamber means, and

(f) means defining a gas disengaging chamber located below and connected to said seal leg chamber means to receive said gravitating particle bed from said seal leg chamber means and to separate gas from said particle bed as said particle bed gravitates through said gas disengaging chamber means.

4,551,207

SEPARATION OF ISOPROPYL ETHER FROM ACETONE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Division of Ser. No. 456,321, Jan. 6, 1983, Pat. No. 4,459,179. This application Feb. 3, 1984, Ser. No. 576,545

Int. Cl.⁴ B01D *3/40;* **C07C** *41/42, 45/83*

U.S. Cl. 203—56 **3 Claims**

1. A method for recovering isopropyl ether from a mixture of isopropyl ether and acetone which comprises distilling a mixture of isopropyl ether and acetone in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure isopropyl ether as overhead product and obtaining the extractive agent and acetone from the stillpot or reboiler, the extractive agent comprises at least adiponitrile.

4,551,208

RECOVERY OF FORMIC ACID BY DISTILLATION

Kaspar Bott, Wachenheim; Gerd Kaibel, Lampertheim; Horst Hartmann, Boehl-Iggelheim; Rudolf Irnich, Bobenheim, and Horst Buelow, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

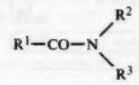
Filed May 25, 1984, Ser. No. 614,280

Claims priority, application Fed. Rep. of Germany, May 31, 1983, 3319651

Int. Cl.⁴ B01D *3/34*

U.S. Cl. 203—60 **10 Claims**

1. In a process for the recovery of formic acid, by distillation from its mixture with a solvent of the formula



I

where R^1 is hydrogen, methyl, ethyl or vinyl and R^2 and R^3 are each alkyl, cycloalkyl, aryl or aralkyl, or R^2 and R^3 together form a 1,4- or 1,5-alkylene group, in each case of not more than 8 carbon atoms, with the proviso that the sum of the number of carbon atoms in R^2 and R^3 is 7 to 14 and that only one of these radicals is aryl, the improvement which comprises:

carrying out the distillation in the presence of a carboxamide II which is selected from the group consisting of formamide, acetamide, propionamide and the same compounds substituted by N-methyl or N,N-dimethyl, and which has a boiling point lower than that of the solvent I.

4,551,209

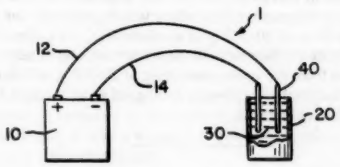
METHOD OF CALIBRATING CONDUCTIVE METAL OXIDE ELECTRODES

Imants R. Lauks, Sewell, N.J., assignor to Integrated Ionics, Inc., Princeton, N.J.

Filed Jan. 19, 1984, Ser. No. 572,200

Int. Cl.⁴ G01N *27/00*

U.S. Cl. 204—1 T **2 Claims**



1. A method for calibrating conductive metal oxide electrodes wherein the oxide is an oxide of a metal selected from the group consisting of platinum and rhenium group metals comprising the steps of:

immersing said metal oxide electrode into a solution of known pH;

immersing a reference electrode into said solution, and

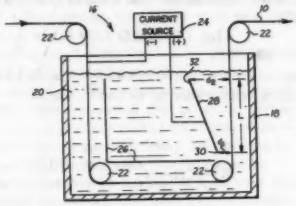
applying across said metal oxide electrode and said reference electrode a potential equal to approximately the steady state potential that is observed for a second electrode having substantially the same chemical composition as said metal oxide electrode when said second second electrode is immersed in a solution of the same pH and is allowed to stabliize slowly in open circuit conditions.

4,551,210

DENDRITIC TREATMENT OF METALLIC SURFACES FOR IMPROVING ADHESIVE BONDING

Arvind Parthasarathi, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 13, 1984, Ser. No. 670,238
Int. Cl.[4] C25D *5/34, 5/48, 17/00*
U.S. Cl. 204—28 **21 Claims**



1. An apparatus for improving the adhesive properties of a metal or metal alloy material, said apparatus comprising:

a cell containing an electrolyte solution, said metal or metal alloy material being at least partially immersed in said solution; and

means for applying a continuously decreasing current density to said material, said current density applying means comprising an anode positioned at an angle with respect to said material for applying an initial current density to said material in excess of the limiting current density of said solution to form a plurality of dendrites thereon and for applying a final current density below the limiting current density to said material to bond said dendrites to said material.

4,551,211

AQUEOUS ANODIZING SOLUTION AND PROCESS FOR COLORING ARTICLE OF MAGNESIUM OR MAGNESIUM-BASE ALLOY

Waichi Kobayashi, and Satoru Takahata, both of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jul. 17, 1984, Ser. No. 631,577
Claims priority, application Japan, Jul. 19, 1983, 58-131690; Aug. 12, 1983, 58-148495
Int. Cl.[4] C25D *5/50*
U.S. Cl. 204—37.6 **9 Claims**

1. An aqueous anodizing solution for anodizing an article of magnesium or magnesium-base alloy which contains, per one liter volume thereof, 20–300 g. of an aluminate, 1–8 moles of an alkali hydroxide per one mole of the aluminate, and at least one kind selected from the group consisting of 20–200 g. of a boron compound, 2–50 ml. of a phenol, 2–50 g. of a sulfate, and 5–70 g. of an iodine compound.

4,551,212

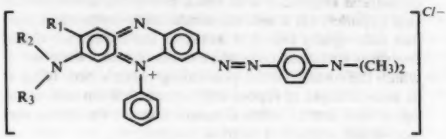
BATH AND PROCESS FOR THE ELECTRODEPOSITION OF MICROMACHINABLE COPPER AND ADDITIVE FOR SAID BATH

Srinivas T. Rao, Kendall Park, and Louis Trager, Raritan, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 11, 1985, Ser. No. 710,290
Int. Cl.[4] C25D *3/38*
U.S. Cl. 204—52 R **13 Claims**

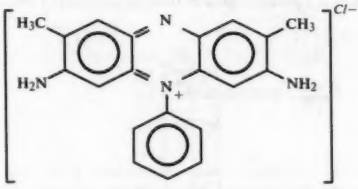
1. An additive for use in an electrodeposition bath comprised of an aqueous acidic solution of copper sulfate, said additive being comprised of a mixture of phenazine dyestuffs in the combination of:

(a) from about 30 to about 40 percent by weight of one or more Janus Green B type dyestuffs of the formula



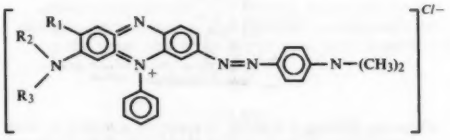
wherein R_1 is hydrogen or methyl, and R_2 and R_3 are the same or different and are methyl or ethyl; and

(b) from about 70 to about 60 percent by weight of Safranine T of the formula



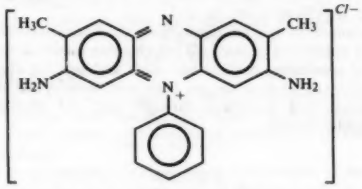
3. A bath for electrodepositing copper comprising an aqueous acidic solution of copper sulfate having dissolved therein an additive comprised of a mixture of phenazine class dyestuffs in the combination of:

(a) from about 30 to about 40 percent by weight of one or more Janus Green B type dyestuffs of the formula



wherein R_1 is hydrogen or methyl, R_2 and R_3 are the same or different and are methyl or ethyl; and

(b) from about 70 to about 60 percent by weight of Safranine T represented by the formula



in an amount sufficient to cause said copper to have a grain size of about 200 to about 500 Angstroms and a hardness of about 250 to about 320 on the Knoop hardness scale.

4,551,213

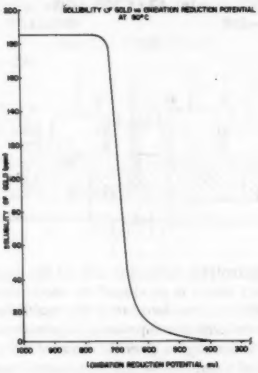
RECOVERY OF GOLD

Alex T. Wilson, Tucson, Ariz., assignor to Duval Corporation, Houston, Tex.

Filed May 7, 1984, Ser. No. 607,713
Int. Cl.[4] C25R *1/20*
U.S. Cl. 204—111 **16 Claims**

1. A method for the recovery of gold values from ore mixtures thereof which contain gold in admixture with sulfur, which method comprises the following steps:

(a) forming an aqueous suspension of the ore mixture containing the gold and sulfur values;
(b) raising the chloride concentration of the suspension by the addition of a member selected from the group consisting of an alkali metal chloride, an alkali earth metal chloride, and mixtures thereof, so that the suspension contains about 12 to 47 weight percent of chloride;
(c) adding an oxidizing agent to the suspension in sufficient amounts to raise the oxidization reduction potential of the suspension to the range of about 650–750 millivolts, said oxidation reduction potential (ORP) being measured as the electrical potential in millivolts between a platinum electrode and a silver/silver chloride electrode, said oxidation reduction potential being insufficient to attack sulfur contained in the suspension;



(d) maintaining the acidity (pHE) of the mixture in the range of from 400 to 550 millivolts, measured as the electrical potential in millivolts between a glass electrode and a silver/silver chloride electrode, said acidity being a pH of below 0;
(e) adding 3.5 to 27 weight percent of cupric chloride or ferric chloride to said suspension to oxidize the gold and cause the gold contained in the ore mixture to dissolve into the solution separated from the sulfur; and
(f) recovering the gold from the solution.

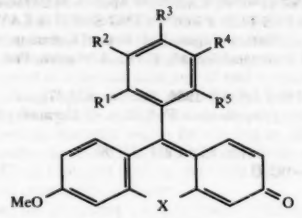
4,551,214

PHOTOCHEMICAL PREPARATION OF PREVITAMIN D

Hans-Jürgen Hansen, Riehen, and Karlheinz Pfoertner, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 14, 1984, Ser. No. 620,418
Claims priority, application Switzerland, Jul. 1, 1983, 3637/83
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—159 **5 Claims**

1. A process for the preparation of previtamin D which is substantially free from tachysterol, which process comprises irradiating a mixture of previtamin D and tachysterol with light of a wavelength of about 400 nm to about 600 nm in the presence of a compound of the formula



(I)

wherein R^1–R^4, independently, are hydrogen or chlorine, R^5 is —COOMe or —SO_3Me, Me is an alkali metal cation and X is oxygen, sulfur or selenium.

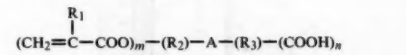
4,551,215

CURABLE RESIN COMPOSITION

Junichi Sakamoto, Otsu; Hiroshi Fujimoto, Shiga, and Hideo Miyake, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1983, Ser. No. 527,934
Claims priority, application Japan, Sep. 2, 1982, 57-152936
Int. Cl.[4] C08J *3/28;* **C08L** *33/00, 63/00*
U.S. Cl. 204—159.23 **3 Claims**

1. A curable resin composition which comprises
(I) an epoxy compound having at least two epoxy groups,
said epoxy compound being a member selected from the group consisting of polyglycidyl ethers of di- or more polyhydric phenol, polyglycidyl ethers of di- or more polyhydric alcohol, polyglycidyl esters of di- or more polyvalent carboxylic acid, polyglycidyl ethers which are obtained by substituting an active hydrogen combined to a nitrogen atom of aniline or isocyanuric acid, alicyclic polyepoxy compound, and aminopolyepoxy compound,
(II) a component selected from the group consisting of a photopolymerizable compound having from one to three carboxyl groups in the molecule, and a mixture of not less than 10% by weight of said photopolymerizable compound and at least one other photopolymerizable compound,
said photopolymerizable compound having from one to three carboxyl groups in the molecule being a compound of the formula:



in which R_1 is hydrogen or methyl group, R_2 and R_3 are each aliphatic, aromatic or alicyclic hydrocarbon residues A is on ester bond, m and n are each a positive integer of 1 to 3, and
(III) a photosensitizer,
said epoxy compound (I) and component (II) being incorporated in a weight ratio range of 10:90 to 90:10 and in an equivalent ratio range of epoxy group: carboxyl group of 1:3 to 33:1,
said photosensitizer being incorporated into the resin mixture in an amount of 0.05 to 20% by weight, based on the total weight of the epoxy compound and the photopolymerisable compound,
said composition being adapted to be subjected to active beam irradiation to polymerize component (II) to form a carboxyl group-containing polymer and thereafter to be subjected to heating to effect reaction of a carboxyl group in the resultant carboxyl group-containing polymer with an epoxy group in the epoxy compound (I) to effect complete curing.

4,551,216

LAYER CONTAINING CARBON AND A METHOD AND APPARATUS FOR PRODUCING SUCH A LAYER

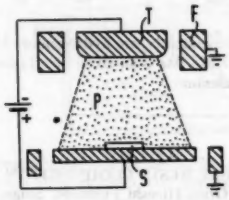
Wilhelm Argyo, Osterwarngau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,476

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335623

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—192 C 32 Claims



1. In a method for producing a carbon-containing layer on a substrate by means of sputtering, wherein the improvement comprises:

incorporating at least one of the materials selected from the group consisting of hydrocarbon molecules and parts of hydrocarbon molecules into the carbon-containing layer during the sputtering by providing an inert gas/hydrocarbon atmosphere between a target and said substrate.

4,551,217

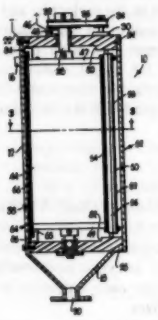
LIQUID TREATER HAVING HINGE-ACTION CLEANING BRUSHES

Arthur S. King, 8021 Cherokee, Leawood, Kans. 66206

Filed Aug. 27, 1984, Ser. No. 644,390

Int. Cl.[4] B05C *5/02*

U.S. Cl. 204—212 12 Claims



1. In a liquid treater having electrode means therein for creating an electric field, said electrode means including an elongated electrode, means for cleaning adhering particles from said electrode comprising:

a support adjacent said electrode;

a scrubber;

hinge means swingably mounting said scrubber on the support;

means for yieldably biasing said scrubber about said hinge means into engagement with the electrode; and

means for providing relative rotational movement between said electrode and the support for wiping the surface of said electrode with said scrubber during said relative rotation,

said support comprising a second electrode of said electrode means, each of said electrodes having a scrubber hingedly mounted thereon and yieldably biased into engagement with the opposite electrode.

4,551,218

ELECTROLYTIC REDUCTION CELLS

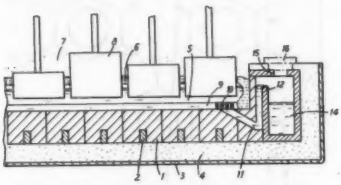
Adam J. Gesing; John McIntyre; Meine Vandermeulen, all of Kingston, Canada; Edward L. Cambridge, Tucson, Ariz., and Charles J. Rogers, Whitebridge, Australia, assignors to Alcan International Limited, Montreal, Canada

Filed Jun. 23, 1983, Ser. No. 391,410

Claims priority, application United Kingdom, Jun. 25, 1981, 8119589

Int. Cl.[4] C25B *3/08*

U.S. Cl. 204—240 8 Claims



1. In an electrolytic reduction cell of the type in which a molten product metal is produced by electrolysis of a fused electrolyte which is less dense than the molten product metal the improvement which comprises a filter located in a product metal accumulation region over the floor of the cell, said filter being formed of a material which is resistant to attack by both the molten product metal and the fused electrolyte and which is wettable by the molten product metal and is non-wettable by said electrolyte, said filter having at least one passage therethrough sized to permit flow of molten metal therethrough, but to restrain flow of molten electrolyte under the maximum driving force acting on the electrolyte at the filter, means being provided for maintaining a back pressure of molten metal at the outlet side of the filter.

4,551,219

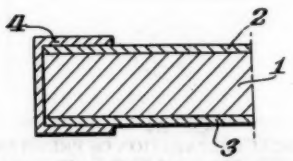
FLUSH EDGE PROTECTED METAL LAMINATES

Gary D. Flick, Pittsburgh, and John H. Reinshagen, North Huntingdon, both of Pa., assignors to Pfizer Inc., New York, N.Y.

Filed May 21, 1984, Ser. No. 612,157

Int. Cl.[4] C25B *11/00*

U.S. Cl. 204—290 R 11 Claims



1. A process for producing a flush edge protected laminate adapted to be used as a substrate for an electrode in an electrolytic cell and comprising an inner sheet of a corrodable metal sandwiched between outer sheets of a protective metal, which comprises forming a C-shaped channel of the protective metal having an inside dimension substantially equal to the thickness of the laminate to be protected, placing said C-shaped channel over the edge to be protected and attaching at to the upper and lower surfaces of the laminate and rolling the laminate with the attached channel at a temperature from room temperature to 1000° F. (538° C.) in a rolling mill set to the gauge of the

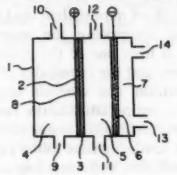
laminate, thereby deforming the channel and underlying portion of the laminate to result in a protective edge whose overlapping sides are flush with the upper and lower surfaces of the laminate.

7. A bimetallic laminate having one or more of its edges protected by a protective edge produced by a process according to claim 1.

4,551,220
GAS DIFFUSION ELECTRODE MATERIAL

Yoshio Oda, and Takeshi Morimoto, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 517,957
Claims priority, application Japan, Aug. 3, 1982, 57-134768; Aug. 3, 1982, 57-134769
Int. Cl.⁴ C25B *11/12*
U.S. Cl. 204—294 **7 Claims**

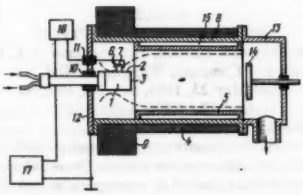


1. A gas diffusion electrode material which comprises a continuously micro-porous electrically insulating material and partially graphitized carbon black powder uniformly incorporated in the insulating material, said continuously microporous electrically insulating material comprising numerous fine nodes of polytetrafluoroethylene and fine fibers of a polytetrafluoroethylene extending from the nodes and three dimensionally connecting the nodes to one another, the nodes being partially in contact or connected with one another, said partially graphitized carbon black powder being carbon black which has been graphitized to a graphitization ratio of from 10% to 90% by subjecting the carbon black to a treatment at a temperature of from 1,200° C. to 2,500° C. for 5 to 60 minutes.

4,551,221
VACUUM-ARC PLASMA APPARATUS

Ivan I. Axenov, ulitsa Valtera, 21-a, kv. 45; Viktor G. Bren, ulitsa Sumskaya, 124, kv. 3; Valentin G. Padalka, ulitsa Danilevskogo 10, kv. 122; Leonid P. Sablev, ulitsa P.Morozova, 3, kv. 3; Rimma I. Stupak, ulitsa Valtera, 12, kv. 32, and Vladimir M. Khoroshikh, prospekt 50-letiya VLKSM, 42, kv. 128, all of Kharkov, U.S.S.R.

PCT No. PCT/SU81/00022, § 371 Date Feb. 23, 1982, § 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00075, PCT Pub. Date Jan. 7, 1982
Continuation of Ser. No. 355,577, Feb. 23, 1982, abandoned.
This PCT application Mar. 2, 1981, Ser. No. 640,554
Claims priority, application U.S.S.R., Jun. 25, 1980, 2933851
Int. Cl.⁴ C23C *13/08*
U.S. Cl. 204—298 **2 Claims**



1. A vacuum-arc plasma apparatus comprising:

a cylindrical body;

a consumable cathode mounted within said cylindrical body at a first axial end thereof, said consumable electrode being part of means for generating plasma;

means for supporting a substrate to be treated by said plasma located at a second axial end of said cylindrical body;

a working end face being part of said consumable cathode and facing said second axial end of said cylindrical body;

an igniting electrode means for starting an arc discharge in combination with said consumable cathode and said working end face, said igniting electrode disposed alongside of said consumable cathode;

means for generating a longitudinally continuous symmetric magnetic field throughout the interior of said cylindrical body including:

a tubular anode;

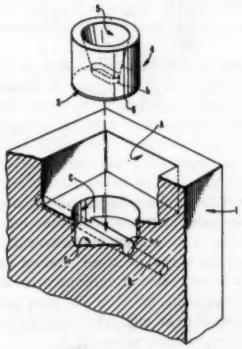
a solenoid coaxially disposed with respect to said cylindrical body and encircling said tubular anode and said consumable cathode, said solenoid extending axially beyond said igniting electrode at the side opposite to the working end face of the consumable cathode by a length exceeding half the length of the portion of said solenoid disposed around said consumable electrode, the number of turns per unit length of said portion of said solenoid around said consumable electrode being greater than the number of turns per unit length in the remaining portion of said solenoid;

said magnetic field provides in the presence of the plasma a radial constituent electric field along the entire length of said tubular anode to prevent the plasma from deviating towards the walls of said anode.

4,551,222
FLOW THROUGH SYSTEM LIQUID MEMBRANE TYPE ELECTRODE

Hiroaki Uematsu, and Junji Aoki, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Jun. 19, 1984, Ser. No. 622,262
Claims priority, application Japan, Jun. 25, 1983, 58-99728[U]
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—417 **6 Claims**



1. An electrode, comprising:

a synthetic resin block having a liquid containing space formed therein;

an internal liquid contained in said liquid containing space;

an internal electrode contained in said liquid containing space immersed in said liquid;

a straight line sample passage extending entirely and straight through said block for carrying liquid therethrough, having a continuous straight boundary surface portion extending entirely through said block and consisting of two cylindrical first sections having uniform equal diameters and a second section between said two first sections;

a communicating space connecting said sample passage and said liquid containing space having a flat planar interior surface, said second section of said sample passage extending along said interior surface and having an outer periphery having a uniform, smooth, concavely arched cross section such that the furthest point in said cross section of said second portion from the plane of said planar interior surface is a distance from said plane equal to said diameter of said first sections;

a cylindrical membrane holding member fitted in said communicating space;

a liquid membrane member held between said sample passage and said communicating space such that said liquid membrane member faces said sample passage, blocking communication between said sample passage and said liquid; and

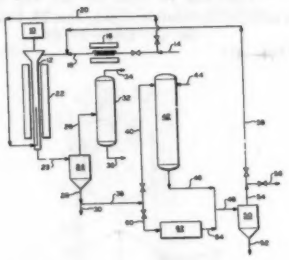
a lid covering said liquid containing space so that said lid and said block enclose said internal liquid.

4,551,223

THERMAL FLASHING OF CARBONACEOUS MATERIALS

Pasupati Sadhukhan, Katy, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 19, 1984, Ser. No. 590,827
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—8 R **17 Claims**



1. A method for flashing liquids and gases from a particle-form, normally solid, carbonaceous material, comprising:

(a) introducing a carrier gas into a descending body of said carbonaceous materials in an amount and at a pressure sufficient to entrain said carbonaceous material and produce a descending body of the thus entrained carbonaceous material in an elongated flashing zone at a pressure of about atmospheric pressure;

(b) heating at least one of (1) said carrier gas prior to introduction into said carbonaceous material and (2) said descending body of entrained carbonaceous material to a temperature, between about 800° F. and about 1500° F., sufficient to flash a maximum amount of gases and liquids therefrom and minimize decomposition of the thus flashed gases and liquids; and

(c) maintaining said carbonaceous material in said flashing zone for a residence time, between about 40 and about 500 milliseconds, sufficient to thus maximize flashing of said gases and liquids and thus minimize decomposition of said flashed gases and liquids.

4,551,224

COAL LIQUEFACTION PROCESS

Erven J. Kuhlmann, Hopewell Jct., N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,323
Int. Cl.[4] C10G *1/06, 1/00*
U.S. Cl. 208—10 **16 Claims**

1. A process for the liquefaction of ground coal or similar liquefiable carbonaceous solids which comprises:

(1) introducing a pumpable slurry of dried ground coal or liquefiable carbonaceous solids with a solvent mixture produced in (4) into a liquefaction reaction zone where a digestion reaction takes place while in the presence of about 1000 to 100,000 standard cubic feet of hydrogen-rich gas from (3) per barrel of slurry so that the hydrogen content of said solvent is maintained; wherein said solvent is a mixture comprising at least 78 wt. % decalin comprising cis-and trans-decalin and with the cis-decalin comprising at least 80 wt. % of the total weight of the decalin, about 0–2 wt. % of naphthalene and/or about 0–5 wt. % of constituent comprising the mono and/or dimethyl derivative of at least one of the other constituents in the solvent mixture, and the remainder of the solvent mixture comprising tetralin; and wherein said digestion reaction takes place at a temperature in the range of about 700° F. to 900° F., a pressure in the range of about 0 to 300 atmospheres, and a residence time in the range of about 2 to 75 minutes; and wherein said operating conditions are chosen so as to maintain said solvent mixture and the dissolved coal in substantially liquid phase;

(2) separating the effluent from (1) in a separating zone into (a) a gaseous mixture comprising hydrogen-containing gas, and hydrocarbonaceous and carbonaceous gases, (b) light hydrocarbon distillate having an atmospheric boiling point in the range of about 10° F. to 360° F., (c) middle hydrocarbon distillate having an atmospheric boiling point in the range of about 360° F. to 480° F., (d) heavy hydrocarbon distillate having an atmospheric boiling point in the range of about 480° F. to 1000° F., and (e) a bottoms product;

(3) producing a hydrogen-rich gas from the bottoms product with or without admixture with a portion of the heavy hydrocarbon distillate from (2) in a hydrogen-producing zone including free-flow partial oxidation, cooling, scrubbing, water-gas shifting, and purifying to produce said hydrogen-rich gas at the temperature and pressure for the liquefaction reaction zone in (1) and/or the solvent mixture hydrogenation zone in (4); and

(4) in a solvent mixture hydrogenation zone catalytically hydrogenating at a temperature in the range of about 40° F. to 850° F. and a pressure in the range about 0.1 to 204 atmospheres at least a portion of the middle distillate from (2) with a portion of the hydrogen-rich gas produced in (3) while in contact with a hydrogenation catalyst selected from the group consisting of finely divided pure metal ruthenium, rhodium, rhenium, irridium, platinum, and mixtures thereof; or the oxides or sulfides of a metal selected from the group consisting of ruthenium, rhodium, rhenium, and mixtures thereof so as to produce the solvent mixture that is reacted in (1).

4,551,225

HIGH ANISOTROPIC PITCH

Ghazi B. Dickakian, Kingwood, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 23, 1984, Ser. No. 613,205
Int. Cl.[4] C10C *3/00, 3/06*
U.S. Cl. 208—43 **3 Claims**

1. In a process for preparing an essentially 100% mesophase pitch suitable for spinning into carbon fibers wherein a pitch feed material is heat-soaked at a temperature of from about 350° C. to 450° C.; the improvement which comprises passing an inert gas through said pitch feed at a rate of from 2.5 to 3.5

SCFH/lb of pitch feed during said heat-soaking treatment and while said pitch feed is agitated at a stirrer rate ranging from about 300 to 500 rpm to obtain mechanical agitation sufficient, in combination with the inert gas rate, to produce an essentially 100% mesophase pitch product at an inert gas rate of from 2.5 to 3.5 SCFH.

4,551,226

HEAT EXCHANGER ANTIFOULANT

Richard L. Ferm, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 26, 1982, Ser. No. 352,818
Int. Cl.[4] C10G *9/16*
U.S. Cl. 208—48 AA **12 Claims**

1. A process for reducing heat exchanger fouling in which a liquid hydrocarbon stream is passed through a heat exchanger at a temperature from 0° to 1500° F. wherein from 1 to 500 parts per million of an anti-fouling additive is added to said hydrocarbon stream, said additive consisting essentially of an organic hydroxylamine wherein said hydroxylamine is an N,N-dialkylhydroxylamine and wherein said stream is crude oil or a fraction thereof.

4,551,227

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Randall A. Porter, and Larry E. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Barlesville, Okla.

Filed Apr. 16, 1984, Ser. No. 600,753
Int. Cl.[4] C10G *9/00, 9/12, 9/16*
U.S. Cl. 208—48 AA **14 Claims**

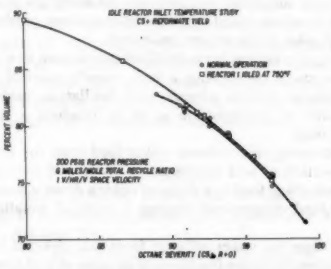
1. A method for reducing the formation of coke on the metals which are contacted with a gaseous stream containing hydrocarbons in a thermal cracking process comprising the step of contacting said metals with an antifoulant selected from the group consisting of a combination of tin and phosphorus, a combination of phosphorus and antimony and a combination of tin, antimony and phosphorus.

4,551,228

METHOD FOR IMPROVING REFORMER YIELD SELECTIVITY

Amilcare Ramella, Woodbury, and Hsin-Ju Wang, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 1, 1984, Ser. No. 605,741
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—65 **14 Claims**


IDLE REACTOR INLET TEMPERATURE STUDY
C5+ REFORMATE YIELD
○ NORMAL OPERATION
□ REACTOR I IDLED AT 750°F
200 PSIG REACTOR PRESSURE
6 MOLES/MOLE TOTAL RECYCLE RATIO
1 WT/HR/WT SPACE VELOCITY
PERCENT VOLUME
OCTANE SEVERITY (RON + 0)

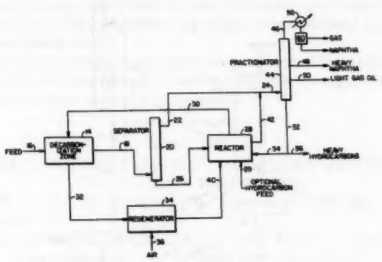
1. In a method for reforming naphtha boiling range hydrocarbon charge stocks with platinum group metal-containing reforming catalysts employing a plurality of catalyst bed reactors, the improvement whereby reformer C_5+ yield selectivity is enhanced which comprises operating at least one reactor at near-quenching conditions comprising inlet temperatures ranging from about 316° to 427° C. (600° to 800° F.) while operating at least one reactor under yield-selective reforming conditions conditions comprising inlet temperatures ranging from about 454° to 549° C. (850° to 1020° F.).

4,551,229

CRACKING OF HEAVY HYDROCARBONS WITH IMPROVED YIELDS OF VALUABLE LIQUID PRODUCTS

Theresa A. Pecoraro, Danville; Russell R. Krug, San Rafael, and Joanne Deady, Rodeo, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 19, 1984, Ser. No. 590,600
Int. Cl.[4] C10G *51/02;* **C10B** *55/02*
U.S. Cl. 208—76 **25 Claims**



1. A process for catalytically cracking a hydrocarbon charge which comprises:

(a) contacting the hydrocarbon charge in a coked catalyst zone at a temperature of at least 800° F. with a coked cracking catalyst having significantly reduced cracking activity, whereby at least a portion of the hydrocarbon charge is vaporized;

(b) separating the hydrocarbon vapors into at least a high boiling fraction and a low boiling fraction;

(c) reducing the amount of coke on the coked catalyst of step (a) in a regeneration zone by contacting the coked catalyst with molecular oxygen for a sufficient residence time and at a suitable temperature to regenerate the cracking catalyst;

(d) cracking the high boiling fraction from step (b) in the absence of added free hydrogen in a cracking zone by contacting said high boiling fraction with the regenerated cracking catalyst, whereby a hydrocarbon product having a lower average molecular weight than the high boiling fraction is produced and coke is deposited on the cracking catalyst to significantly lower its cracking activity; and

(e) introducing the coked cracking catalyst of step (d) into the coked catalyst zone for the purpose of contacting additional hydrocarbon charge.

4,551,230

DEMETALLIZATION OF HYDROCARBON FEED STREAMS WITH NICKEL ARSENIDE

Simon G. Kukes, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1984, Ser. No. 655,798
Int. Cl.[4] C10G *45/00, 45/04, 45/08*
U.S. Cl. 208—89 **26 Claims**

1. A process for the demetallization of a hydrocarbon containing feed stream, which contains metals selected from the group consisting of vanadium and nickel, comprising the step of contacting said hydrocarbon containing feed stream under suitable demetallization conditions with hydrogen and a catalyst composition comprising (a) an alumina-containing support and (b) nickel arsenide, $NiAs_x$, wherein x ranges from about

0.33 to about 2.0, such as to produce a hydrocarbon containing stream having a reduced content of said metals.

4,551,231

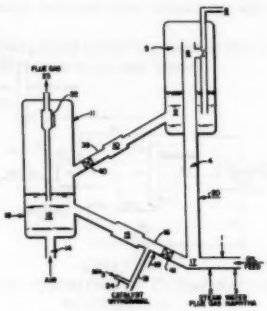
AMMONIA CONTACTING TO PASSIVATE METALS DEPOSITED ON A CRACKING CATALYST DURING REDUCED CRUDE PROCESSING

Stephen M. Kovach, Ashland, and James L. Palmer, Flatwoods, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 311,725, Oct. 13, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,503

Int. Cl.[4] C10G *11/05, 11/18;* **B01J** *29/38*

U.S. Cl. 208—120 **14 Claims**



1. A process for passivating metal contaminants of an equilibrium zeolite fluid cracking catalyst containing vanadium and nickel contaminants which arise from use of said catalyst in continuous fluid catalytic cracking of a carbometallic heavy hydrocarbon oil feed, said process comprising contacting said catalyst, after regeneration thereof, with ammonia in an amount sufficient to convert at least a portion of said contaminant metals from an oxide form to nitrides and reusing the passivated catalyst in a continuous fluid catalytic cracking process.

5. A process for fluid catalytic cracking comprising the sequential steps of:

(a) cracking in a hydrocarbon conversion zone a hydrocarbon feed containing at least 5 ppm metals as nickel and vanadium and having a Conradson carbon of at least 2 wt.% in the presence of equilibrium zeolite cracking catalyst containing at least 1000 ppm vanadium and nickel contaminants,

(b) separting vaporous hydrocarbon conversion products to yield a coked catalyst,

(c) regenerating said coked catalyst in a regeneration zone at conditions sufficient to remove at least a portion of any carbonaceous deposits whereby the metal contaminants are converted to an oxide form to produce a regenerated catalyst,

(d) stripping said regenerated catalyst to remove occluded regeneration gases,

(e) contacting the stripped catalyst in a passivation zone with ammonia in an amount sufficient to convert vanadium pentoxide to vanadium nitride to form a passivated catalyst, and

(f) recycling said passivated catalyst to said hydrocarbon conversion zone.

12. A process for fluid catalytic cracking comprising the steps of:

(a) cracking in a hydrocarbon conversion zone a carbometallic hydrocarbon feed at a pressure of about 10–50 psia and at temperatures of about 925° F.–1050° F. in the presence of a zeolite catalyst contaminated with vanadium compounds,

(b) regenerating coked catalyst at conditions wherein vanadium pentoxides are produced,

(c) passing the regenerated catalyst to a stripping zone and stripping entrained oxygen containing gas from the catalyst,

(d) contacting the stripped catalyst with ammonia to convert vanadium pentoxides to vanadium nitride and thereby to passivate said catalyst,

(e) removing a minor portion of the passivated catalyst containing at least 1000 ppm vanadium from the cracking process for disposal in a landfill and

(f) recycling a major portion of the passivated catalyst to said hydrocarbon conversion zone.

4,551,232

PROCESS AND FACILITY FOR MAKING COKE SUITABLE FOR METALLURGICAL PURPOSES

Jose L. Calderon, Caracas, and Humberto Betancourt, Corralito Estado Miranda, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Feb. 9, 1983, Ser. No. 465,210

Int. Cl.[4] C10G *7/00, 9/14*

U.S. Cl. 208—92 **13 Claims**

1. A process for the production of metallurgical coke from a heavy crude oil feedstock comprising:

(a) providing a crude oil feedstock inlet;

(b) feeding a crude oil feedstock to said crude oil inlet, said crude oil feedstock being characterized by the following composition and properties:

Gravity, °API	6–12
Viscosities:	
KV at 180° F., cst	400–2500
KV at 140° F., cst	2000–20000
KV at 122° F., cst	5000–40000
Metals Content:	
Iron, wt ppm	15–25
Vanadium, wt ppm	300–500
Nickel, wt ppm	60–120
Asphaltenes, % wt	6–12
Salt Content as NaCl, Lbs/1000 BBls.	35–1000
Pour Point, °F.	50–90
Sulfur, % wt	3.5–4.5
Water and Sediments, % Vol	0.2–10

(c) mixing said crude oil feedstock with a diluent in an amount equal to about 10 to 50% by volume, said diluent being characterized by a gravity of between 20 to 65 API and a boiling point range of between 150° F. and 800° F.;

(d) feeding the crude oil and diluent mixture to an atmospheric distillation unit wherein said crude oil and diluent mixture is subjected to distillation whereby gas products, a 500° F. minus liquid overheat hydrocarbon product and 500° F. plus residuum are produced;

(e) feeding the atmospheric distillation residuum to a combination tower comprising a heat transfer portion and a fractionator portion wherein said distillation residuum is subjected to fractionation so as to produce a reduced coker feed;

(f) withdrawing said reduced coker feed from the fractionator portion of said combination tower and passing said reduced coker feed to a delayed coking drum wherein the coker feed decomposes leaving a mass of metallurgical coke;

(g) recycling the coker effluent from said delayed coking drum directly to the fractionator portion of said combination tower;

(h) contacting said atmospheric distillation residuum with said coker effluent in the fractionator portion of said combination tower so as to produce a reduced coker feed mixed with recycle;

(i) withdrawing said coker feed mixed with recycle from the fractionator portion of said combination tower and pass-

ing said coker feed mixed with recycle to a delayed coking drum wherein the coker feed mixed with recycle decomposes leaving a mass of metallurgical coke; and

(j) recycling the coker effluent from said delayed coking drum directly to the fractionator portion of said combination tower wherein said incoming atmospheric distillation residuum is contacted with the coker effluent.

4,551,233

CONTINUOUS THERMAL CRACKING PROCESS

Petrus M. M. Blauwhoff, and Anton E. Cornelissen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 24, 1984, Ser. No. 643,897

Claims priority, application United Kingdom, Sep. 2, 1983, 8323635

Int. Cl.[4] C10G *9/00*

U.S. Cl. 208—106 **1 Claim**

1. A process for the continuous thermal cracking of hydrocarbon oils in a horizontal soaker vessel having an upper end and a lower end, which comprises: heating a hydrocarbon oil feed containing said hydrocarbon oils; introducing said heated hydrocarbon oil feed into said soaker vessel having its interior divided into a plurality of consecutive compartments in fluid intercommunication by means of a plurality of substantially vertical extending separation means, each of said means consisting of a pair (2) of spaced apart separating walls defining a plurality of soaker compartments, wherein said wall of said pair closest to the feed inlet is in physical contact and is erected from the lower end of the soaker vessel and continues upright and terminates at a location proximate to, but not in contact with, the upper end of the soaker vessel to define a fluid passageway above the upper end of said wall and the upper end of said soaker vessel and to define a gas collecting space in the upper end of the soaker vessel in said respective soaker compartment and wherein said wall of said pair closest to the product outlet is in physical contact and is erected from the upper end of the soaker vessel and continues downward and terminates at a location proximate to, but not in connection with, said lower end of the soaker vessel to define a fluid passage below the lower end of said wall, said walls acting to form fluid passage from one compartment to the next adjacent compartment, and wherein the upwardly extending wall decreases in height with respect to the upwardly extending wall in said next adjacent compartment thereby forming a relative larger gas collecting space in the upper end of the soaker vessel in said next adjacent compartment; passing said heated hydrocarbon oils over and under said walls to cause said heated hydrocarbon oils to pass horizontally in a serpentine flow pattern through said soaker vessel; collecting the relative quantity of gas evolved from the heated soaking of said hydrocarbon oils in said respective gas collecting space situated at the upper part of each respective compartment; separately withdrawing said collected gas from each gas collection space contained within said consecutive compartments; and withdrawing thermally cracked hydrocarbon oils from the last of said pluralities of consecutive compartments.

4,551,234

RECLAIMING LUBE OIL IN MRS UNIT

William P. Hettinger, Jr., Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 3, 1984, Ser. No. 637,378

Int. Cl.[4] C10M *11/00;* **C10G** *25/00, 25/09, 71/00*

U.S. Cl. 208—179 **3 Claims**

1. A process for disposing of contaminated used lube oil by converting it to useful product, comprising:

(a) contacting a particulate sorbent of low catalytic capability with a carbo-metallic oil feed containing 340° C.[+] (650° F.[+]), essentially free of used lube oil in a first contactor to form purified products and contaminated sorbent formed from contact with said carbo-metallic oil feed;

(b) separating said purified products from said contaminated sorbent formed from contact with said carbo-metallic oil feed;

(c) regenerating said contaminated sorbent formed from contact with said carbo-metallic oil feed by heating said contaminated sorbent formed from contact with said carbo-metallic oil feed from about 533° C. to about 683° C. in the presence of oxygen-containing gases;

(d) withdrawing a lesser portion of the regenerated particulate sorbent to pass through a second, smaller contactor;

(e) contacting said regenerated particulate sorbent portion in said second contactor with said contaminated used lube oil for a period of time in a range of about 1 to 3 seconds at a temperature of about 350° C. to about 500° C. and converting said used lube oil to substantially decontaminated hydrocarbon product; and

(f) separating contaminated sorbent formed from contact with said used lube oil from the product formed in said second contactor; and

(g) returning said contaminated sorbent formed from contact with said used lube oil to said regenerator for regeneration and recycle to said first contactor.

4,551,235

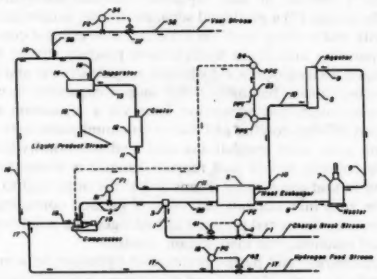
UTILITY CONSERVATION IN HYDROGEN RECYCLE CONVERSION PROCESSES

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 374,857, May 4, 1982, Pat. No. 4,477,413. This application Jun. 28, 1984, Ser. No. 625,415

Int. Cl.[4] C10G *45/72, 47/36, 49/26, 35/24*

U.S. Cl. 208—100 **8 Claims**



1. A control method for reducing the flow of hydrogen in hydrocarbon conversion apparatus, thereby reducing heating load and compression load in said conversion apparatus, where said conversion apparatus comprises (1) an inlet conduit for transporting a charge stock stream, which inlet conduit is in interconnection with a conduit for transporting a vaporous hydrocarbon-hydrogen recycle stream; (2) a reaction zone for reacting hydrocarbonaceous materials comprising said charge stock stream to form a converted hydrocarbon effluent stream, which reaction zone is in communication with said vaporous hydrocarbon-hydrogen recycle stream conduit; (3) a reaction zone effluent conduit having a hydrogen partial pressure sensor therein, said effluent conduit containing said converted hydrocarbon effluent stream; (4) a cooling zone for cooling said converted hydrocarbon effluent stream to provide, via condensing, a liquid hydrocarbon product stream and at least a portion of said vaporous hydrocarbon-hydrogen recycle stream; (5) a cooling zone effluent conduit in communication with a gas-liquid separation zone, said gas-liquid separation zone effective to separate said liquid hydrocarbon product stream from said vaporous hydrocarbon-hydrogen recycle stream; and (6) a compressor means having variable output capability in communication with said separation zone via a separation zone vaporous effluent conduit and also in communication with said recycle stream conduit; said control method consisting of:

(a) sensing the partial pressure of hydrogen at a point down-

stream of said reaction zone in said reaction zone effluent conduit;

(b) comparing said partial pressure of hydrogen to a previously determined value and developing a signal correlating thereto;

(c) transmitting said signal to said variable output compressor; and

(d) controlling the quantity of vaporous hydrocarbon and hydrogen recycled to said reaction zone, via said recycle stream conduit, in accordance with said signal, such that when said partial pressure is higher than said previously determined value, the output of said compressor is decreased, and when said partial pressure is lower than said previously established value, the output of said compressor is increased.

6. A control method for reducing the flow of hydrogen in hydrocarbon conversion apparatus, thereby reducing heating load and compression load in said conversion apparatus, where said conversion apparatus comprises (1) an inlet conduit for transporting a charge stock stream, which charge stream inlet conduit is in interconnection with a conduit for transporting a vaporous hydrocarbon-hydrogen recycle stream; (2) a reaction zone inlet stream conduit in communication with said vaporous hydrocarbon-hydrogen recycle stream conduit and a reaction zone, said inlet stream conduit having a means to sense the partial pressure of hydrogen contained therein; (3) said reaction zone for reacting hydrocarbonaceous materials comprising said charge stock stream to form a converted hydrocarbon effluent stream; (4) a cooling zone in communication with said reaction zone, via a reaction zone effluent conduit, for cooling and condensing said converted hydrocarbon effluent from said reaction zone to form a liquid hydrocarbon product stream and at least a portion of said vaporous hydrocarbon-hydrogen recycle stream; (5) a gas-liquid separation zone in communication with said cooling zone, via a cooling zone effluent conduit, for separating said liquid hydrocarbon product stream from said vaporous hydrocarbon-hydrogen recycle stream; and (6) a compressor means having variable output capability in communication with said separation zone via a separation zone vaporous effluent conduit and also in communication with said reaction zone inlet conduit via said hydrocarbon-hydrogen recycle conduit, where said recycle conduit is connected at one end to said compressor means and at the other end to said reaction zone inlet conduit; said control method consisting of:

(a) sensing the partial pressure of hydrogen at a point within said reaction zone inlet stream conduit;

(b) comparing said partial pressure of hydrogen to a previously determined value and developing a signal correlating thereto;

(c) transmitting said signal to said variable output compressor; and

(d) controlling the quantity of vaporous hydrocarbon and hydrogen recycled to said reaction zone, via said recycle stream conduit, in accordance with said signal, such that when said partial pressure is higher than said previously determined value, the output of said compressor is decreased, and when said partial pressure is lower than said previously established value, the output of said compressor is increased.

4,551,236

CONVERSION PROCESSES WITH TITANIUM-CONTAINING MOLECULAR SIEVES

Brent M. T. Lok, New City; Bonita K. Marcus, Rye, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 480,738, Mar. 31, 1983, Pat. No. 4,500,651. This application Jul. 3, 1984, Ser. No. 627,515

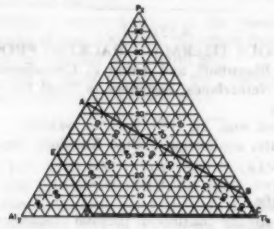
Int. Cl.[4] C10G *11/04, 11/05, 45/12, 47/04*

U.S. Cl. 208—112 **27 Claims**

1. Process for converting a hydrocarbon which comprises contacting said hydrocarbon under effective process conditions, wherein the process is a cracking process with at least one crystalline molecular sieve selected from the group consisting of crystalline molecular sieves comprising pores having nominal diameters of greater than about 3 Angstroms and whose chemical composition in the as-synthesized and anhydrous form is represented by the unit empirical formula:

$$mR:(Ti_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the



moles of "R" present per mole of $(Ti_xAl_yP_z)O_2$ has a value of between zero and about 5.0; and "x", "y" and "z" represent the mole fractions of titanium, aluminum and phosphorus, respectively, present as tetrahederal oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of the ternary diagram which is FIG. 1 of the drawings and points A, B, C, D and E representing the following values for "x", "y" and "z":

	Mole Fraction		
Point	x	y	z
A	0.001	0.45	0.549
B	0.88	0.01	0.01
C	0.98	0.01	0.01
D	0.29	0.70	0.01
E	0.001	0.70	0.299

19. Process for converting a hydrocarbon which comprises contacting said hydrocarbon under effective process conditions, wherein the process is a hydrotreating process with at least one crystalline molecular sieve selected from the group consisting of crystalline molecular sieves comprising pores having nominal diameters of greater than about 3 Angstroms and whose chemical composition in the as-synthesized and anhydrous form is represented by the unit empirical formula:

$$mR:(Ti_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the moles of "R" present per mole of $(Ti_xAl_yP_z)O_2$ has a value of between zero and about 5.0; and "x", "y" and "z" represent the mole fractions of titanium, aluminum and phosphorus, respectively, present as tetrahederal oxides, said mole.fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of the ternary diagram which is FIG. 1 of the drawings and points A, B, C, D and E representing the following values for "x", "y" and "z":

	Mole Fraction		
Point	x	y	z
A	0.001	0.45	0.549
B	0.88	0.01	0.01
C	0.98	0.01	0.01
D	0.29	0.70	0.01
E	0.001	0.70	0.299.

4,551,237

ARSENIC REMOVAL FROM SHALE OILS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 25, 1982, Ser. No. 392,161

Int. Cl.[4] C10G *7/00*

U.S. Cl. 208—251 R **11 Claims**

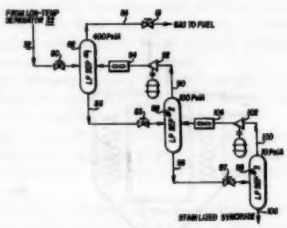
1. A method for removing arsenic from shale oil which comprises contacting the oil with a sulfide material in the presence of water and separately recovering an aqueous fraction and an oil fraction of reduced arsenic content.

4,551,238

METHOD AND APPARATUS FOR PRESSURE-CASCADE SEPARATION AND STABILIZATION OF MIXED PHASE HYDROCARBONACEOUS PRODUCTS

Charles E. Marks, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 6, 1984, Ser. No. 668,788
Int. Cl.[4] C10G *49/22*
U.S. Cl. 208—340 **4 Claims**



1. A method for separating and stabilizing a hydro-treater effluent, comprising the steps of:

expanding the effluent from a high pressure to an intermediate pressure in a first expansion drum, resulting in both gaseous and liquid phase hydrocarbon components;

drawing off said gaseous phase hydrocarbon components as a gas product;

expanding said liquid phase hydrocarbon components from said intermediate pressure to a lower intermediate pressure in a second expansion drum, evolving secondary gaseous and liquid phase hydrocarbon components;

compressing and cooling said secondary gaseous phase hydrocarbon components and returning the cooled components to said first expansion drum; and

withdrawing said secondary liquid phase hydrocarbon components.

4,551,239

WATER BASED DEMULSIFIER FORMULATION AND PROCESS FOR ITS USE IN DEWATERING AND DESALTING CRUDE HYDROCARBON OILS

Philip Merchant, Houston, and Sylvia M. Lacy, Pearland, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 558,614, Dec. 6, 1983, abandoned, which is a continuation of Ser. No. 483,608, Apr. 11, 1983, abandoned. This application Jul. 18, 1984, Ser. No. 631,980
Int. Cl.[4] C10G *33/02, 33/04*
U.S. Cl. 208—188 **20 Claims**

5. A process for desalting an oil characterized as conventional whole petroleum crudes, petroleum crude fractions and residua, which comprises

(a) dispersing from 1 ppm to about 1000 ppm of an aqueous admixture of at least one demulsifier and at least one deoiler within said oil, the demulsifier being a water-soluble alkylene oxide alkyl phenol-formaldehyde condensate having a Relative Solubility Number ranging from 13 to 30 and a deoiler having a formula

$$HO\left(CH_2-\underset{\underset{R}{|}}{CH}-O\right)_n H$$

wherein R is H or CH_3 and n is an integer ranging from 1 to 1000, and

(b) recovering a clean oil product containing less than 5 pounds of salt per thousand barrels of crude, said Relative Solubility Number being the amount of water in ml required to reach the cloudpoint at 25° C. of the solution of 1 gram of said demulsifier dissolved in 30 ml of a solvent system made up of 4% xylene in dioxane.

15. An aqueous formulation suitable for the desalting of petroleum crudes and residua comprising a water-soluble alkylene oxide alkyl phenol-formaldehyde condensate demulsifier having a Relative Solubility Number ranging from 13 to 30, said Relative Solubility Number being the amount of water in ml required to reach the cloudpoint at 25° C. of the solution of 1 gram of said demulsifier dissolved in 30 ml of a solvent system made up of 4% xylene in dioxane said demulsifier being combined with a deoiler having a formula

$$HO\left(CH_2-\underset{\underset{R}{|}}{CH}-O\right)_n H$$

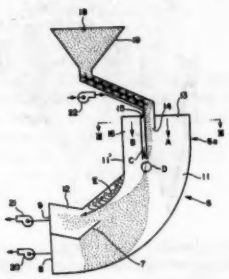
wherein R is H or CH_3 and n is an integer of 1 to 1000, the weight ratio of deoiler to said demulsifier ranging from 1:20 to 20:1.

4,551,240

APPARATUS FOR CLASSIFYING PARTICULATE MATERIAL WITH AIR CURRENTS

Masaru Beppu; Setsuo Agawa; Takeshi Hazeyama, and Toshiyuki Nashimoto, all of Tokyo, Japan, assignors to Nittetsu Mining Co., Ltd., Japan

Filed Jan. 30, 1984, Ser. No. 575,173
Claims priority, application Japan, Feb. 8, 1983, 58-18133
Int. Cl.[4] B07B *7/086*
U.S. Cl. 209—143 **3 Claims**



1. An apparatus for classifying particulate material using air currents, comprising:

a curved conduit having an upper portion and a lower portion, and having an inner side wall and an outer side wall, said upper portion defining a main passage;

particulate material supply means having a particulate material supply port opening into said main passage of said upper portion for supplying particulate material into said upper portion;

a partition plate disposed in said lower portion of said conduit between said inner and outer side walls for dividing an interior of said lower portion into an outside first discharge port defined between said outer side wall and said partition plate and an inside second discharge port defined between said inner side wall and said partition plate;

said conduit including a primary air inlet in said upper portion thereof between said outer side wall and said material supply port, said conduit including a secondary air inlet port in said upper portion between said inner side wall and said material supply port;

air blower means in communication with said conduit for establishing a primary air current from said primary inlet port to said lower portion of said conduit and a secondary air current from said secondary air inlet port to said lower portion of said conduit;

means defining a tertiary air current inlet port in said upper portion of said conduit between said secondary air inlet port and said material supply port; and

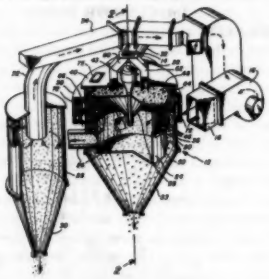
high velocity air current means in communication with said tertiary air current inlet port for supplying high velocity air through said tertiary air current inlet port and into said main passage directly adjacent said material supply port whereby said particulate material from said material supply port is drawn into a narrow zone immediately upsteam of the tertiary air current inlet port by a venturi effect within said main passage of said upper portion.

4,551,241

PARTICLE CLASSIFIER

Ronald R. Saverse, Boston, and Harold T. Jones, Weymouth, both of Mass., assignors to Sturtevant, Inc., Boston, Mass.

Filed Feb. 8, 1984, Ser. No. 578,268
Int. Cl.[4] B07B *9/02*
U.S. Cl. 209—148 **7 Claims**



1. A particle classifier comprising:

a cylindrical rejector cage mounted for rotation about its cylindrical axis having an open bottom and a disc-shaped top;

drive means located above said rejector cage for imparting rotation thereto;

feed material inlet means for directing feed material to the said top of said rejector cage for centrifugal dispersion;

means defining an annular separation zone immediately surrounding said cylindrical rejector cage;

air passage means for directing air around and radially inward through said separation zone toward said rejector cage so as to blow said feed material against said rejector cage;

coarse hopper means coaxially disposed below said separation zone for receiving course material rejected by said rejector cage;

a cylindrical stationary fines chamber coaxially disposed immediately below said rejector cage surrounded by said coarse hopper, said fines chamber having an open top a side wall and a closed bottom;

a plurality of outlet ports defined in the side wall of said fines chamber;

a plurality of corresponding openings in said coarse hopper;

a plurality of outlet ducts connected to said fines chamber side wall at said outlet ports and extending sealingly through said corresponding openings in said coarse hopper;

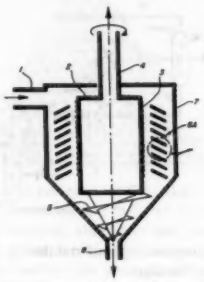
said fines chamber being supported primarily by said ducts so as to be suspended in said coarse hopper coaxially below said rejector cage.

4,551,242

APPARATUS FOR DYNAMIC CLASSIFICATION OF SUSPENSIONS OF SOLID BODIES IN LIQUIDS

Andrzej Mróz, and Stanislaw Wro ski, both of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Filed Oct. 11, 1984, Ser. No. 659,718
Claims priority, application Poland, Oct. 12, 1983, 244126
Int. Cl.[4] B03D *1/00*
U.S. Cl. 209—211 **1 Claim**



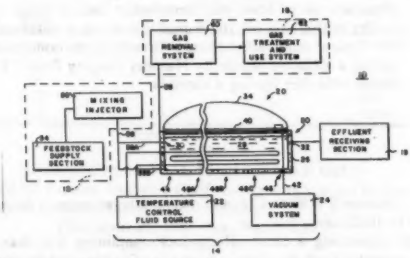
1. In an apparatus for dynamic classification of suspensions of solid bodies in liquids, consisting of a vertically arranged cylindrical body with a conical bottom terminated with an outlet stub pipe, said apparatus being provided with an inlet stub pipe situated tangentially and a rotatable vertically mounted cylindrical perforated element situated co-axially within said cylindrical body, said element being covered with a gauze mesh and mounted on a vertically arranged hollow drive shaft, said apparatus being characterized in that a cylindrical space is provided between the inner wall of the body and the gauze defining an agitation zone in which there are mounted a plurality of stationary annular baffles which do not contact either the body or the gauze, each said baffle having an outwardly and downwardly sloping profile between an inner circular edge and an outer circular edge, and are generally nested one beneath the other in a vertical arrangement and so spaced from one another that the outer edge of the upper annular baffle lies below the inner edge of the next lower annular baffle, and the rotatable cylindrical element has connected to its bottom a thickening means in the form of a worm screw rotatable within the conical bottom part of said body.

4,551,243

ANAEROBIC DIGESTER

John H. Martin, Gosport, Ind., assignor to Energy Cycle, Inc., Kansas City, Mo.

Filed Aug. 16, 1982, Ser. No. 408,073
Int. Cl.[4] B01D *35/18*
U.S. Cl. 210—180 **13 Claims**



1. Apparatus comprising:

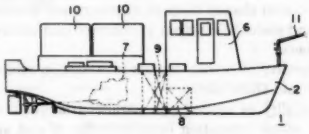
walls forming a digester vessel closed to the atmosphere;
said digester vessel having an inlet side and an outlet side defining between them a flow path in a longitudinal direction along a longitudinal axis along which material to be digested flows and having transverse planes extending in a transverse direction perpendicular to the longitudinal axis;
means for removing gas from said digester vessel;
said digester vessel having dimensions in the transverse planes sufficiently large to permit a bulk flow of a slurry of material to be digested containing between ten and fifteen percent of solids between said inlet side and said outlet side along the flow path and having a horizontal zone containing substantially more of said solids than the remainder of the digester material;
means for causing mixing of said material in said digester vessel in the transverse direction without substantial mixing in the longitudinal direction;
means for injecting new slurry into said digester vessel at said inlet end through a plurality of openings spaced apart in the transverse direction across a transverse line at said inlet end;
the sum of the diameters of said openings being at least two percent of the transverse length in the transverse direction;
said openings being spaced no more than twenty feet apart along the transverse direction;
said transverse line being at the same vertical elevation as said zone so that at least ninety percent of said openings and said zone of solid material overlap, whereby said new material flows into said zone of solid material;
said means for injecting including means for injecting a slurry having between ten and fifteen percent solid material into it with a momentum per cubic foot of inlet slurry of at least 0.1 pound-foot per second, whereby the scum layer boundary within said digester vessel is reduced; and
said means for causing mixing in the transverse direction including means for controlling the temperature of said slurry to maintain it between 95 degrees Fahrenheit and 140 degrees Fahrenheit.

4,551,244

SPILLED OIL PROCESSING CATAMARAN

Junichi Inoue, Yokosuka, Japan, assignor to Hikari Industry Co., Ltd, Japan

Filed Feb. 21, 1984, Ser. No. 582,199
Claims priority, application Japan, Feb. 25, 1983, 58-29378
Int. Cl.[4] C02F *1/40*
U.S. Cl. 210—198.1 **11 Claims**



1. A spilled oil collecting apparatus for collecting spilled oil drifting in the water surface, comprising:
a pair of floats arranged in parallel spaced apart relation over a predetermined distance;
a deck integrally provided with and extending between said pair of floats, said deck being provided with at least one opening;
a connection member extending between said pair of floats, said connection member being disposed at the front of said apparatus in a position to be submerged in the water when said apparatus is afloat;
an impeller rotatably supported between said pair of floats and disposed generally above said connection member, said impeller being dipped in the water partly at its bottom;
at least one cage supported to be movable up and down through said opening provided in said deck, said cage being capable of housing therein a one side-opened porous collection bag with its open side directed to the front of said apparatus;
advancing means for advancing said apparatus along the water surface; and
spraying means for spraying a gelling agent for causing oil to gel over the water surface in front of said apparatus.

4,551,245

ACYLATED POLYETHYLENIMINE BOUND CHROMATOGRAPHIC PACKING

Hugh E. Ramsden, Scotch Plains, N.J., and Michael Henry, Easton, Pa., assignors to J. T. Baker Chemical Co., Phillipsburg, N.J.

Filed Apr. 22, 1985, Ser. No. 725,807
Int. Cl.[4] C02F *1/68*
U.S. Cl. 210—198.2 **13 Claims**

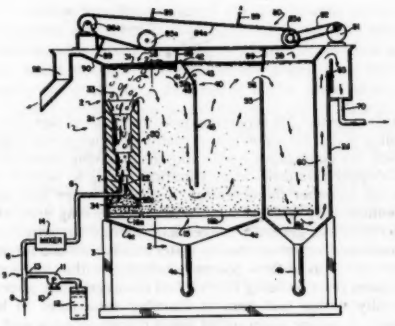
1. The N-acylated covalently bound, non-crosslinked polyethylenimine reaction product of particulate silica gel having an average particle diameter of from about 3 to about 70 microns and an average pore size of from about 50 to about 1000 Angstrom units, or particulate controlled pore glass having an average particle diameter of from about 37 to about 177 microns and an average pore size of from about 40 to about 1000 Angstrom units, with polyethyleniminopropyl trimethoxy silane having an average molecular weight of from about 400 to about 1800, wherein the N-acyl function has the formula: R—CO—, in which R is a member selected from the group consisting of C_{1-8} alkyl, phenyl, aralkyl and phenyl substituted with one or more substituents selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, halo and nitro.

4,551,246

FLOTATION APPARATUS UTILIZING A NOVEL FLOC BARRIER AND CURRENT DIVERTING MEANS

Samuel F. Coffing, Miami, Fla., assignor to International Resources Management, Inc., Coral Gables, Fla.

Filed Sep. 30, 1982, Ser. No. 428,773
Int. Cl.[4] C02F *1/24*
U.S. Cl. 210—221.2 **8 Claims**



1. An improved flotation apparatus for treating an effluent by forming a separable buoyant floc out of particles of matter suspended in said effluent, wherein said apparatus is of the type which includes a treatment tank having an outlet on one side where treated effluent flows out of the tank, a floc collection region on an opposing side including a floc outlet where buoyant floc is collected and swept out of the tank, a mixing means for mixing incoming effluent and a stream of bubbles which generates fluid currents in the floc collection region which push the buoyant floc away from the floc collection region and toward the outlet, and a skimming means including at least one

blade for sweeping buoyant floc near the surface of the effluent in the tank into the floc collection region in said tank, wherein the improvement comprises

a floc barrier and current diverting means disposed between the outlet and the floc collection region including

(a) a top barrier wall having a substantially linear cross-section, and an upper edge in close proximity to the surface of the effluent for blocking buoyant floc from moving away from the floc collection region and toward said outlet region in response to said fluid currents, and a lower portion which is movably mounted in said tank for freely yielding to the passage of the blade of said skimming means, wherein said top barrier wall is biased at an incline toward the floc accumulation area in order that it may divert said fluid currents away from said outlet region and toward the bottom of the tank, and

(b) a bottom barrier wall having an upper edge which is adjacent the lower edge of the top barrier wall for further diverting said fluid currents away from the outlet and toward the bottom of the tank.

4,551,247

DEVICE FOR SEPARATING SOLID PARTICLES OF DIRT FROM COOLING WATER FOR POWER STATIONS

Werner Borchert, In den Blamüsen, 42, D-4000 Düsseldorf, and Klaus D. Nitsch, Dietrichstr. 26, D-4130 Moers, both of Fed. Rep. of Germany

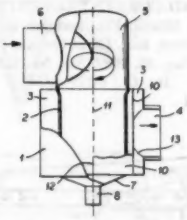
PCT No. PCT/EP83/00099, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03780, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 26, 1983, Ser. No. 579,904

Claims priority, application European Pat. Off., Apr. 26, 1982, 82200496.6

Int. Cl.⁴ B01D *35/24*

U.S. Cl. 210—304 **5 Claims**



1. In a device for separating solid particles of dirt from the cooling water for steam power plants or other power stations, which device includes a screening drum having opposite ends and disposed statically in a cylindrical casing so as to form an annular chamber therebetween, a cooling water inlet spigot communicating with the interior of said screening drum at one of its ends and generally tangentially thereof for introduction of unfiltered incoming cooling water axially into said screening drum and so as to flow generally helically within said screening drum prior to being filtered and codirectionally generally helically within said annular chamber subsequent to being filtered, a cooling water outlet spigot communicating with said annular chamber generally tangentially of said cylindrical casing, and a dirt particle discharge spigot communicating with the interior of said screening drum at the other end thereof and provided with a valve;

the improvement comprising that a baffle is disposed in said annular chamber intermediate said cooling water outlet spigot and the portion of the outer periphery of said screening drum proximate thereto, said baffle extending generally circumferentially of said screening drum over a portion of the outer periphery of the same and having two circumferentially spaced edges, said baffle at one of said edges bearing coaxially against the outer surface of said screening drum and at the other of said edges being spaced from said surface, and the spacing between said baffle and said outer surface of said screening drum increasing as viewed in the direction of helical flow of the cooling water.

4,551,248

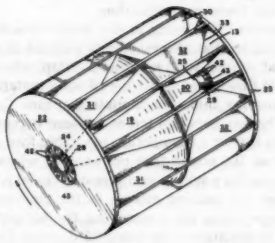
FILTER DRUM FOR ROTARY DRUM VACUUM FILTER

Nevio Lenac, Bridgeport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jun. 3, 1983, Ser. No. 500,640

Int. Cl.⁴ B01D *33/06*

U.S. Cl. 210—404 **1 Claim**



1. A rotary drum vacuum filter having a drum mounted for rotation in a slurry tank through a filtration cycle wherein filter cake is formed on the outer surface of the drum by applied vacuum and filtrate is passed through said drum for discharge through filtrate drainage compartments within said drum to a discharge valve assembly, said drum comprising:

(a) a pair of conical shaped support members having concentrically arranged interconnected peripheral base portions,

(b) a pair of spaced cylindrical end plates havng spaced trunnion housings attached to the outer walls thereof,

(c) shaft means in said trunnion housings concentric with said conical shaped support members and interconnecting said end plates to the apex portions of said conical support members,

(d) a plurality of filtrate outlets provided in said end plates about said shaft means,

(e) a plurality of spaced and parallel triangular shaped divider panels extending longitudinally of and attached to the outer surface of said conical support members in radial relationship thereon,

(f) a plurality of rectangular shaped filtration grid sectors each having transverse end portions connected to said opposite end plates and longitudinal side portions connected to a pair of said adjacent divider panels to provide a plurality of said filtrate drainage compartments about the periphery of said drum of said panels,

(g) said divider panels configurated to conform to the shape of said conical support member to provide sloped floors to said filtrate drainage compartments within said filter discharge outlets located at the lower end of said sloped floors adjacent the apexes of said support member, and

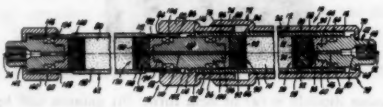
(h) filtrate discharge openings provided in said end plates at said trunnion housings in communication with said filtrate drainage compartments.

4,551,249

MODULAR LIQUID CHROMATOGRAPHY COLUMN APPARATUS

Carl L. Shackelford, San Pablo, and Kenneth Rainin, Piedmont, both of Calif., assignors to Rainin Instrument Co. Inc., Emeryville, Calif.

Filed Feb. 29, 1984, Ser. No. 584,611
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **16 Claims**



1. A high pressure modular liquid chromatography column apparatus utilizing material for separating constituents comprising:

a. a tube filled with the material said tube having a first end portion and a second end portion;

b. means for plugging said first end portion of said tube, said plugging means including a passage therethrough, said plugging means fitting adjacent the material within said tube and being movable within said tube;

c. an end fitting having a portion placed within said tube adjacent said plugging means, said end fitting including a passage therethrough which communicates with said passage of said plugging means;

d. means for sealing a portion of the inside of said tube between said plugging means and said end fitting, portion within said tube, said sealing means extending along the circumference of said inside of said tube;

e. means for retaining said end fitting within said tube; and

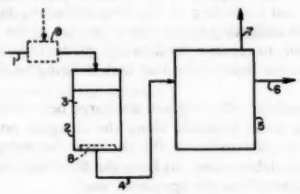
f. means for enclosing said second end portion of said tube, said enclosing means including a passage therethrough from the exterior of said tube to the interior thereof.

4,551,250

PROCESS FOR THE ANAEROBIC BIOLOGICAL PURIFICATION OF WASTEWATER

Manfred Morper, Gelting, and Uwe Fuchs, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,520
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326939
Int. Cl.[4] C02F *3/28*
U.S. Cl. 210—603 **12 Claims**



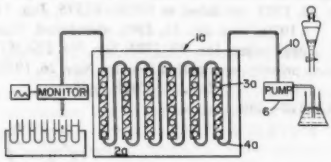
1. In a process for the anaerobic biological purification of wastewater containing organic pollutants wherein the incoming wastewater stream to be purified is conducted through two series-connected reactors operated under anaerobic conditions, the improvement comprising retaining substantially only the pollutants contained in the incoming wastewater stream which are present partially in the undissolved, partially in the macromolecular state and are only gradually metabolizable under anaerobic conditions in the first reactor by means of a filtering medium arranged in the first reactor; transferring the pollutants which are initially present in the incoming wastewater stream in the dissolved state and are substantially rapidly degradable by anaerobic microorganisms directly through the first reactor and without substantial conversion, into the second reactor; retaining the only gradually metabolizable pollutants in the first reactor for a time sufficient to degrade the gradually metabolizable pollutants to low-molecular weight, dissolved fragments, said first reactor being operated at a pH of less than 7, and containing hydrolyzing and acidifying bacteria and substantially no methanogenic bacteria; and conducting the thus-degraded and dissolved low-molecular weight fragments to the second reactor together with the initially rapidly degradable pollutants for further degradation therein in the presence of methanogenic bacteria so as to produce methane, the entire reactor volume of the first and second reactors being just about sufficient to conduct the degradation in the first reactor and the methanization in the second reactor on a continuous basis, said entire reactor volume being less than the reactor volume required if the degradation and the methanization were conducted in a single reactor.

4,551,251

MONOLITHIC INTEGRATED FLOW CIRCUIT

Theodor Kolobow, Rockville, and Yoichiro Ito, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 6, 1984, Ser. No. 587,682
Int. Cl.[4] B01N *15/08*
U.S. Cl. 210—635 **18 Claims**



16. A method for counter-current chromatography comprising separating a first liquid from a second liquid with which said first liquid is mixed by passing a mixture of said first and second liquid through a monolithic integrated flow circuit consisting essentially of a deformable matrix plate having a flow circuit formed therein, said deformable matrix plate being of formed plastic or metallic thin-gauge sheets, at least one of said sheets having a pattern formed by embossing thereon, said sheets being bonded together to form said flow pattern, said pattern defining a plurality of locules, each of said locules being joined to an adjacent locule by an integral transfer conduit and subjecting said mixture to counter-current chromatography in said column.

4,551,252

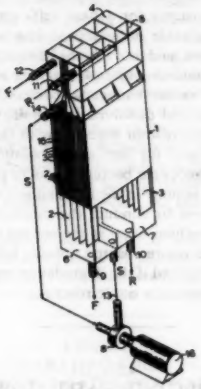
METHOD OF AND APPARATUS FOR MASS TRANSFER BETWEEN THREE LIQUID PHASES

Lyubomir A. Boyadjiev, Sofia, Bulgaria, assignor to Edinen Centar Po Chimia, Sofia, Bulgaria

Filed Dec. 20, 1982, Ser. No. 451,335
Claims priority, application Bulgaria, Dec. 18, 1981, 54604
Int. Cl.[4] B01D *11/04, 13/00*
U.S. Cl. 210—638 **5 Claims**

1. Method for mass transfer between three liquid phases wherein two of such phases are miscible and the other one of said phases is immiscible with respect to the other two phases and serves as an intermediate phase, comprising flowing the

two miscible liquids down surfaces which are wettable by said immiscible liquids, said surfaces being separated by a space



occupied by the third, intermediate phase, said third phase being forcibly circulated.

4,551,253

METHOD FOR REMOVING OIL FROM WATER WITH AN ABSORBENT

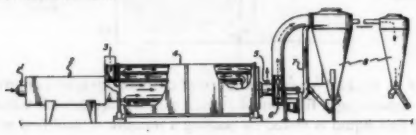
Bo Grenthe, Avesta, Sweden, assignor to N.Y. Patent Development Corp., New York, N.Y.

Continuation of Ser. No. 285,105, filed as PCT SE80/00299 Nov. 25, 1983, published as WO81/01575, Jun. 11, 1981, § 102(e) date Jul. 14, 1981, abandoned. This application Jan. 20, 1984, Ser. No. 572,351

Claims priority, application Sweden, Nov. 26, 1979, 7909748-1

Int. Cl.[4] C02F *1/28*

U.S. Cl. 210—680 **7 Claims**



1. A method for removing oil or other petroleum-based products contaminating a body of water, comprising dispersing over the contaminated water an amount of an absorbent material sufficient to substantially absorb the oil or petroleum-based products therefrom, said absorbent material comprising the fibrous product obtained by subjecting a moisture-containing fibrous starting material, consisting essentially of a member selected from the group consisting of sulphite reject from a paper mill process, and a combination of sulfite reject and sulphate reject from a paper mill process, to rapid forced heating at temperatures effective to gasify moisture in said starting material and to cause said starting material to expand or burst.

4,551,254

MACROPOROUS MANGANESE DIOXIDE WATER PURIFIER

Nobuyuki Imada, and Toshiteru Okada, both of Takehara, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,781

Claims priority, application Japan, Jun. 22, 1983, 58-111090

Int. Cl.[4] C02F *1/28*

U.S. Cl. 210—688 **5 Claims**

5. The method of purifying raw water from impurities of manganese, iron and coloring matters which consists of passing the raw water through a water purifier which consists essentially of discrete particles of manganese dioxide having macroscopic pores through which water is able to pass, wherein said

manganese dioxide is (a) of beta form; (b) gamma and beta-mixed form and wherein said particles have needle-like or columnar crystals on the surfaces.

4,551,255

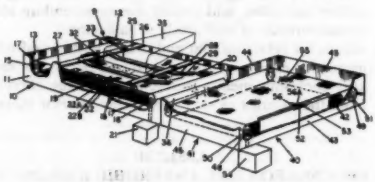
CONTINUOUS FILTER SCREEN SYSTEM FOR REMOVING PARTICLES FROM A LIQUID

R. Craig Miller, 12957 Glenda St., Cerritos, Calif. 90701, assignor to R. Craig Miller, Cerritos and Pro/Pak Industries, Inc., Fullerton, both of, Calif., a part interest

Filed Oct. 17, 1984, Ser. No. 661,609

Int. Cl.[4] B01D *33/02*

U.S. Cl. 210—770 **20 Claims**



1. An apparatus for continously filtering debris from a carrier liquid, which comprises:

(a) a first liquid collecting tank, defining an elongate portion;

(b) an endless filter belt of woven polymeric fabric mesh, the filter belt defining upper and lower surfaces and being rotatable over the elongate portion of the tank and adapted to filter debris from the liquid;

(c) feed means for supplying liquid and debris to the filter belt along an upper surface, the liquid passing through the belt and collecting in the first collecting tank, and the debris collecting on the upper surface of the filter belt;

(d) means to remove the debris from the filter belt;

(e) a second liquid collecting tank defining an elongate portion;

(f) an endless collecting and discharge belt of woven plastic fabric mesh rotatable along the elongate portion of the second collecting tank, the discharge belt being adapted to collect debris removed from the filter belt and discharge the debris from the apparatus; and,

(g) liquid recycling means adapted to: i. remove liquid and debris from the second liquid collecting tank and feed the upper surface of the filter belt; ii. remove a portion of filtered liquid from the first collecting tank to flush debris from the lower surface of the filter belt; and, iii. reclaim liquid remaining in the first collecting tank.

12. A process for continuously filtering debris from a carrier liquid, which comprises:

(a) feeding liquid and debris to an endless filter belt of woven polymeric mesh fabric along an upper surface, the filter belt being rotatable over an elongate portion of a first collecting tank;

(b) passing the liquid through the belt, collecting the liquid

in the first collecting tank, and collecting the debris on the upper surface of the filter belt;
(c) removing the debris from the filter belt onto an endless collecting and discharge belt of woven polymeric fabric mesh, the discharge belt being rotatable over an elongate portion of a second liquid collecting tank;
(d) passing liquid from the discharge belt into the second liquid collecting tank;
(e) drying the debris on the discharge belt;
(f) removing the debris from the discharge belt;
(g) recycling a portion of filtered liquid from the first collecting tank to flush debris from a lower surface of the filter belt; and,
(h) recycling filtered liquid remaining in the first collecting tank.

4,551,256
SLURRY EXCAVATING METHOD

Daizo Kita, Niiza; Tsutomu Nakamura, Sakai, and Takeshi Kawachi, Tokorozawa, all of Japan, assignors to Ohbayashi-Gumi, Ltd., Osaka and Kuraray Co., Ltd., Okayama, both of, Japan

Filed Jun. 2, 1982, Ser. No. 384,175
Claims priority, application Japan, Jun. 9, 1981, 56-89237; Nov. 9, 1981, 56-180467
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.5 LC **7 Claims**

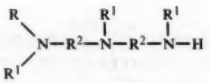
1. A slurry excavating method for excavating ground or drilling a hole by means comprising introducing onto the ground or into the hole a slurry containing a powder of a water absorbing resin which is capable of absorbing at least 10 times its own weight in water and retaining its shape without dissolving when swollen by water, said water absorbing resin being a crosslinked copolymer of an α-olefin and a maleic acid compound selected from the group consisting of maleic acid, maleic acid anhydride, maleinamic acid and maleinimide, whereby loss of water from said slurry employed in said slurry excavating method is prevented.

4,551,257
AMIDES FROM DIALKYLENETRIAMINES AND LUBRICANT AND FUEL COMPOSITIONS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,814
Int. Cl.[4] C10M *1/36*
U.S. Cl. 252—32.7 E **31 Claims**

1. A compound of the formula



wherein R is a C_{10} to C_{30} hydrocarbyl group, R^1 is hydrogen or

group, at least one of R^1 being the latter group in which R^3 is hydrogen or a C_1 to C_4 hydrocarbyl group and R^2 is a C_2 to C_4 hydrocarbylene group.

4,551,258
GREASE COMPOSITION

Makoto Ikeda, and Akira Nakamura, both of Ichihara, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,498
Claims priority, application Japan, Aug. 26, 1983, 58-154924
Int. Cl.[4] C10M *5/24, 5/28*
U.S. Cl. 252—32.7 E **17 Claims**

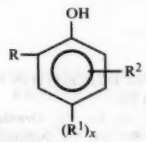
1. A grease composition which comprises:
(a) from 1 to 4 parts by weight of a zinc dithiophosphate;
(b) from 2 to 6 parts by weight of a phosphoric acid ester; and
(c) from 0.5 to 2 parts by weight of an organotin compound admixed in 100 parts by weight of a base grease.

4,551,259
PHENOLIC ANTIOXIDANTS AND LUBRICANTS CONTAINING SAME

Milton Braid, deceased, late of Haddonfield, N.J. (by Gerassimos Frangatos, executor), assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,411
Int. Cl.[4] C10M *1/38*
U.S. Cl. 252—48.2 **20 Claims**

1. A product of reaction made by reacting, under catalytic conditions, a hindered phenol of the formula



wherein R and R^1 are branched alkyl groups containing 3 to 16 carbon atoms, cycloalkyl groups containing 5 to 10 carbon atoms, aryl groups or alkyl-substituted aryl groups wherein the alkyl portion contains 1 to 16 carbon atoms, and the aryl portion contains 6 to 14 carbon atoms, R^2 is hydrogen or a R group and x is 0 or 1, with a thiaalkene of the formula

$$R^3(S)_yR^4$$

wherein R^3 and R^4 are individually unsaturated hydrocarbyl groups containing 3 to 20 carbon atoms and y is 1 or 2.

4,551,260
WET PROCESS OF PREPARING FINE PARTICLES OF FERRITE OF MAGNETOPLUMBITE STRUCTURE

Masanori Hayakawa; Noriaki Yamada, both of Ube; Hiromi Kawamoto, Onoda, and Satoshi Nishimura, Ube, all of Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Jul. 24, 1984, Ser. No. 634,023
Claims priority, application Japan, Jul. 28, 1983, 58-136812; Dec. 6, 1983, 58-229185
Int. Cl.[4] C04B *35/26*
U.S. Cl. 252—62.59 **6 Claims**

1. A process of preparing fine particles of a ferrite having the magnetoplumbite structure, of the formula

$$AO_n(Fe_{2-(2x/6)}{}^{3+}M_{x/6}{}^{2+}Sn_{x/6}{}^{4+}O_3)$$

where A is Ba, Sr, and/or Pb, M is at least one of Fe, Cu, Zn, Co, Ni, Mn and Mg, n is between 4 and 6 and x is between 0.3 and 0.9 which comprises the steps of subjecting a powder of an iron oxide selected from the group consisting of γ-Fe_2O_3 and $(FeO)_x$-Fe_2O_3, where $0<x\leqq 1$, and at least one compound of a divalent metal selected from the group consisting of chlorides, nitrates, and hydroxides of Ba, Sr and Pb to hydrothermal treatment at temperatures in the range from 80° to 360° C. in an aqueous alkali solution in the presence of an oxidizer, the

atomic ratio of the total of Ba, Sr and Pb to Fe in the reaction system being in the range of from 1:8 to 1:12; and

introducing tetravalent tin ions and at least one kind of divalent metal ions selected from the group consisting of Fe^{2+}, Cu^{2+}, Zn^{2+}, Co^{2+}, Ni^{2+}, Mn^{2+}, and Mg^{2+} into the reaction system of the hydrothermal treatment such that the trivalent iron ions in the obtained ferrite having the magnetoplumbite structure are partly substituted by a combination of said divalent metal ions and tetravalent tin ions, the atomic ratio of Sn to Fe being in the range of 0.3:12 to 0.9:12 and the mole ratio of tetravalent tin ions to the total of said divalent metal ions in said reaction system being substantially 1:1.

4,551,261

DUST SUPPRESSION WITH ELASTOMER-CONTAINING FOAM

Mark W. Salihar, Berwyn, Ill., assignor to Dearborn Chemical Co., Lake Zurich, Ill.

Filed May 7, 1984, Ser. No. 607,826

Int. Cl.[4] C09K *3/22*

U.S. Cl. 252—88 **11 Claims**

1. The method of suppressing dust generation by a solid particulate material comprising applying to the material a dust-suppressing amount of a foam comprising water, a foaming agent and an elastomeric water insoluble polymer, said foam having a weight ration of the foaming agent to the polymer of from about 5:95 to about 95:5.

4,551,262

COMPOSITION FOR PREVENTING DEPOSITION OF INORGANIC SALTS

Rafail K. Samakaev, ulitsa Chkalova, 28, kv. 70, Orenburg; Alexandr I. Paguba, mikroraion 4, 55, kv. 96; Nikolai V. Smolnikov, mikroraion 2, 73, kv. 15, both of Shevchenko; Leonid T. Dytjuk, ultisa Narodnaya, 13, kv. 51, Orenburg; Vladimir I. Gusev, ulitsa Ulyanovykh, 57/2, kv. 20, Kazan; Nina M. Dyatlova, 2-oi Samotechny pereulok, 4, korpus 1, kv. 4; Galina F. Yaroshenko, ulitsa Udal t sova, 14, kv. 120, both of Moscow; Anatoly V. Barsukov, ulitsa Orenburgskaya, 88, Orenburg; Ljudmila V. Krinitskaya, ulitsa Scherbakovskaya, 7, kv. 74, and Taisia M. Balashova, 15-ya Parkovaya, 42, korpus 3, kv. 49, both of Moscow, all of U.S.S.R.

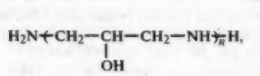
Filed Oct. 5, 1983, Ser. No. 539,324

Int. Cl.[4] C02F *5/10*

U.S. Cl. 252—181 **1 Claim**

1. A composition for preventing deposition of inorganic salts comprising:

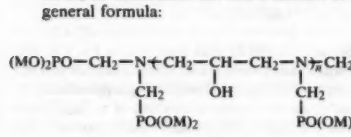
amines selected from group consisting of 1,3-diaminopropanol-2 a derivative of 1,3-diaminopropanol-2 of the general formula:



(I)

wherein n=2 to 20;

and the mixture of said amines, phosphonomethylated derivative of 1,3-diaminopropanol-2 in the form of a salt selected from the group consisting of a salt of an alkali metal, an ammonium salt and a mixture of said salts of the general formula:



(II)

wherein n=1 to 20, M is an alkali metal, NH_4;

chlorides selected from the group consisting of an alkali metal chloride, ammonium chloride and a mixture thereof;

water;

the components being present in the following proportions, percent by weight:

amines selected from group consisting of 1,3-diaminopropanol-2 derivative of 1.3-diaminopropanol-2 of the general formula (I)	0.1–4.5
phosphonomethylated derivative of 1,3-diaminopropanol-2 of the general formula (II)	5.0–50.0
chlorides	3.0–12.0
water	to 100%.

4,551,263

TRIAZOLIDINE-3,5-DIONES AS ACTIVATORS FOR PER-COMPOUNDS

Karl-Wolfgang Schellhammer, Berg.-Gladbach; Ludwig Rottmaier, Odenthal; Rudolf Merten, and Ulrich Schimmel, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

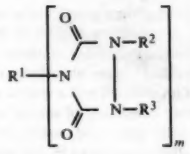
Filed Sep. 13, 1982, Ser. No. 417,722

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136808

Int. Cl.[4] C11D *7/54, 3/38, 3/39*

U.S. Cl. 252—186.39 **40 Claims**

1. A composition comprising a per-compound and an activator, said activator being a compound of the formula



in which

R^1 is hydrogen, C_1–C_{20}-alkyl, C_3–C_7-cycloalkyl, phenyl, phenyl C_1–C_7-alkyl, C_{1-4}-alkylphenyl, halophenyl, the hydrocarbon moieties of which can be substituted by (C_1–C_4 alkoxy)-carbonyl, CN, or halogen, or

R^1 is as defined below for R^2 or is C_4H_9—O—CH_2CH_2C-H_2— or a radical of the formulae

$$-(CH_2)_m- \text{ with } m = 2\text{–}12,$$

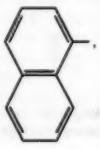
$$-[CH_2-\underset{R^8}{CH}-O]_p-CH_2-\underset{R^8}{CH}-$$

with R^8 = H or CH_3, and p = 1–9,

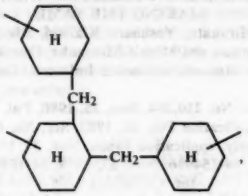
$$-(CH_2)_3-O-(CH_2)_{2-4}-O-(CH_2)_3-,$$

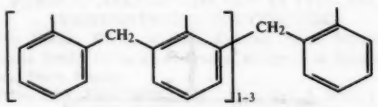
$$\left[-CH_2-(CH_2)_q-\underset{R^9}{N}\right]_r (CH_2)_q-CH_2-$$

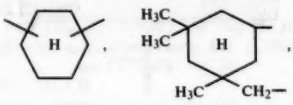
with R^9 = C_{1-4} alkyl, q = 1–2, r = 1–4,

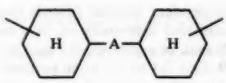


-continued

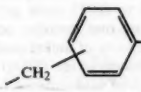


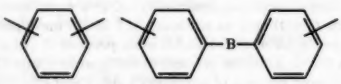






wherein A = Alkylene having 1–4 carbon atoms, —O— or —N(CH3)—





wherein B = alkylene having 1–4 carbon atoms, —O— or —N(CH3)—

R^2 and R^3 are unsubstituted or substituted C_1–C_8 alkyl carbonyl, benzoyl or phenyl C_1–C_4-alkylcarbonyl wherein the substituents are lower alkyl, C_1–C_4 alkoxy, halogen, nitro or cyano; and m is an integer equal to the indicated valence of R^1.

4,551,264

POLYHALOGENOAROMATIC COMPOUNDS FOR LIQUID CRYSTAL COMPOSITIONS

Rudolf Eidenschink, Dieburg; Michael Römer, Rodgau, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

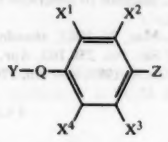
Filed Mar. 14, 1983, Ser. No. 474,862

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209178

Int. Cl.[4] **C09K** *3/34;* **C02F** *1/13;* **C07C** *121/75, 79/12, 49/813, 87/60, 43/225, 69/157, 69/773;* **C07D** *319/06*

U.S. Cl. 252—299.62 **21 Claims**

1. A liquid-crystal dielectric useful in electrooptical display elements comprising at least two liquid-crystalline components, wherein at least one component is a polyhalogenoaromatic compound of the formula



wherein Y and Z are each independently alkyl, alkoxy or alkanoyl each of 1 to 12 C atoms, —COOR[1], —O—CO—R[1], CN, or NO_2; Q is one or two identical or different groups selected from Ph, Cy, or 1,4-bicyclo-[2,2,2]octylene; X^1 to X^4 are each independently H, F, Cl or Br; R^1 is alkyl of 1 to 4 C atoms, Ph—R^2 or Cy—R^2; R^2 is alkyl or alkoxy each of 1–12 C atoms, or CN; Ph is 1,4-phenylene; and Cy is 1,4-cyclohexylene; with the proviso that not more than one of X^1 and X^2 and not more than one of X^3 and X^4 is hydrogen.

4,551,265

FLUORESCENT DYESTUFFS, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS LASER DYESTUFFS

Wolfgang Brinkwerth, Berg.-Gladbach; Wolfgang Hüffer, Cologne; Roderich Raue, Leverkusen; Rudolf Schieder, Huerth, all of Fed. Rep. of Germany, and Helmut Telle, Toronto, Canada, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

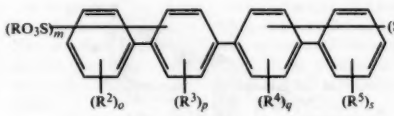
Division of Ser. No. 184,695, Sep. 8, 1980, Pat. No. 4,338,258. This application Dec. 30, 1981, Ser. No. 335,986

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2938132

Int. Cl.[4] **H01S** *3/20;* **C09K** *3/00*

U.S. Cl. 252—301.17 **1 Claim**

1. Process for producing a coherent laser emission in a wavelength range from 360 to 430 nm, wherein a solution of the dyestuff of the general formula



is stimulated by an energy source which is capable of stimulating the dyestuff solution to produce a laser emission and wherein

R and R^1 independently of one another represent hydrogen, a salt-forming cation, an alkyl radical with 1 to 16 C atoms or an aryl or aralkyl radical which is optionally substituted by non-chromophoric groups,

R^2 to R^5 independently of one another represent hydrogen, alkyl, trifluoromethyl, alkoxy, aralkoxy, alkenoxy, aryloxy, halogen or a carboxyl, cyano, alkyl sulphone, aryl sulphone, aralkyl sulphone, carboxamide, sulphonamide or carboxylic acid ester group,

o,p, q and s independently of one another represent 1 or 2 and

m and n independently of one another denote 0, 1 or 2, the sum of m and n being 2 to 4.

4,551,266

TREATMENT OF SUBSTANTIALLY METALLIC ION FREE ACRYLAMIDE AND RELATED COMPOUNDS

George Gotthard, Short Hills, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 362,365, Mar. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 258,103, Apr. 27, 1981, abandoned. This application Jan. 4, 1984, Ser. No. 570,402

Int. Cl.[4] C09K *15/32*

U.S. Cl. 252—400 R 8 Claims

1. A composition comprising:

(a) a monomer of inferior polymerizability selected from acrylamide, acrylic acid and mixtures thereof, said monomer being in the form of a 5 to 20 weight percent aqueous solution having a pH above 8.0, substantially free of any metallic ion and containing only that amount of oxygen or other polymerization inhibitor which would inherently be present in said monomer; and

(b) a monomer-improving amount, insufficient to catalyze polymerization of said monomer of an alkali metal borohydride compound, said borohydride compound being present at about 100 parts per million to about 1000 parts per million based upon the monomer.

4,551,267

ELECTRICALLY CONDUCTIVE PLASTIC COMPLEX MATERIAL

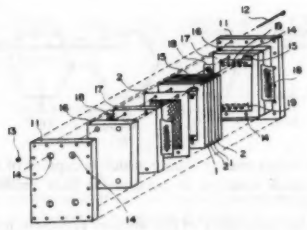
Kazuo Fushimi, Kawaguchi; Hirokazu Tsunakawa, Saitama, and Kunio Yonahara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,160

Claims priority, application Japan, Jan. 27, 1983, 58-10572

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 4 Claims



1. An electrically conductive plastic complex material for use as a halogen battery electrode, said complex material comprising base resin polymer, carbon black and graphite, said base resin polymer being selected from the group consisting of polyethylene, polypropylene and ethylene-propylene copolymer, wherein said material comprises 50 weight percent of said base resin polymer and 20 weight percent of said carbon black, and wherein a part of said graphite is substituted by adsorptive active carbon in order to control halogen diffusion through the electrode, said adsorptive active carbon being in the range of 1 to 30 weight percent of said material.

4,551,268

VOLTAGE-DEPENDENT RESISTOR AND METHOD OF MAKING THE SAME

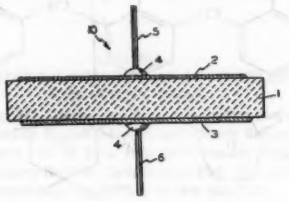
Kazuo Eda, Hirakata; Yasuharu Kikuchi, Moriguchi; Osamu Makino, Katano, and Michio Matsuoka, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 210,394, Nov. 25, 1980, Pat. No. 4,386,021. This application Feb. 10, 1983, Ser. No. 465,678

Claims priority, application Japan, Nov. 27, 1979, 54-154085; Nov. 27, 1979, 54-154086; Nov. 27, 1979, 54-154087

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—519 2 Claims



1. A voltage-dependent resistor of bulk-type comprising a sintered body consisting essentially of, as a main constituent, zinc oxide (ZnO) and, as additives, 0.1 to 3.0 mole percent of bismuth oxide (Bi_2O_3), 0.1 to 3.0 mole percent of cobalt oxide (Co_2O_3), 0.1 to 3.0 mole percent of manganese oxide (MnO_2), 0.1 to 3.0 mole percent of antimony oxide (Sb_2O_3), 0.05 to 1.5 mole percent of chromium oxide (Cr_2O_3), 0.005 to 0.3 mole percent of boron oxide (B_2O_3), at least one member selected from the group of 0.0005 to 0.025 mole percent of aluminum oxide (Al_2O_3) and 0.0005 to 0.025 mole percent of gallium oxide (Ga_2O_3), and at least one member selected from the group of 0.1 to 3.0 mole percent of nickel oxide (NiO) and 0.1 to 10.0 mole percent of silicon oxide (SiO_2) with electrodes applied to opposite surfaces of said sintered body.

2. A voltage-dependent resistor of bulk-type comprising a sintered body consisting essentially of, as a main constituent, zinc oxide (ZnO) and, as additives, 0.1 to 3.0 mole percent of bismuth oxide (Bi_2O_3), 0.1 to 3.0 mole percent of cobalt oxide (Co_2O_3), 0.1 to 3.0 mole percent of manganese oxide (MnO_2), 0.1 to 3.0 mole percent of antimony oxide (Sb_2O_3), 0.05 to 1.5 mole percent of chromium oxide (Cr_2O_3), 0.0005 to 0.3 mole percent of boron oxide (B_2O_3), at least one member selected from the group of 0.0005 to 0.025 mole percent of aluminum oxide (Al_2O_3) and 0.0005 to 0.025 mole percent of gallium oxide (Ga_2O_3), and at least one member selected from the group of 0.1 to 3.0 mole percent of nickel oxide (NiO) and 0.1 to 10.0 mole percent of silicon oxide (SiO_2) and 0.0005 to 0.3 mole percent of silver oxide (Ag_2O), with electrodes applied to opposite surfaces of said sintered body.

4,551,269

NON-LINEAR RESISTOR AND METHOD OF MANUFACTURING THE SAME

Detlev Hennings; Axel Schnell, and Herbert Schreinemacher, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 382,909

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121290

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—520 4 Claims

1. A non-linear resistor having a ceramic sintered body consisting of a polycrystalline alkaline metal titanate doped to N-type conductance with a metal oxide and which sintered body is provided with electrodes on opposite located surfaces thereof characterized in that said body has a Perowskite structure, consists of an alkaline earth metal titanate containing

excess TiO_2, has a formula selected from the group consisting of $(Sr_{1-x}Ln_x)$ $TiO_3.yTiO_2$ and $Sr(Ti_{1-x}Me_x)O_3.yTiO_2$ wherein Ln is a rare earth metal, Me is a metal having a valence of at least 5, $0.0005 < x <$ solubility limit of the Ln in the Perowskite phase and $y = 0.001$ to 0.02 and which sintered body is provided on its grain boundaries with insulating layers produced by re-oxidation.

4,551,270

DNA FRAGMENTS CODING FOR POLYPEPTIDES CONTAINING AT LEAST ONE ANTIGENIC DETERMINANT OF THE PAPILLOMAVIRUS, PARTICULARLY OF THE HPV 1A TYPE AND CORRESPONDING POLYPEPTIDES

Olivier Danos, Paris; Michael Katinka, Saint Mande, and Moshe Yaniv, Paris, all of France, assignors to Institut Pasteur, Paris, France

PCT No. PCT/FR83/00063, § 371 Date Dec. 5, 1983, § 102(e) Date Dec. 5, 1983, PCT Pub. No. WO83/03623, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 1, 1983, Ser. No. 558,188

Claims priority, application France, Apr. 5, 1982, 82 05887

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. A peptide sequence selected from the group consisting of

Leu-Asp-Gln-Phe-Pro-Leu-Gly-Arg-Lys-Phe-Leu,

Leu-Asp-Gln-Phe-Pro-Leu-Gly-Arg-Arg-Phe-Leu,

Ala-Lys-Arg-Arg-Arg-Lys,

and

Ala-Lys-Lys-Lys-Lys-Lys.

4,551,271

PURIFICATION OF INTERFERON BY METAL CHELATE CHROMATOGRAPHY

Erich Hochuli, Arisdorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

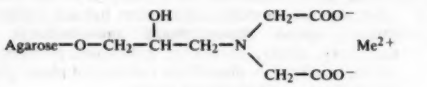
Filed Feb. 27, 1984, Ser. No. 584,286

Claims priority, application Switzerland, Mar. 3, 1983, 1151/83; Dec. 13, 1983, 6642/83

Int. Cl.⁴ C07G *7/00;* **A61K** *45/02*

U.S. Cl. 260—112 R **8 Claims**

1. A process for the purification of interferons, which process comprises bringing an interferon solution into contact with a metal chelate resin of the following structure



in which Me represents copper or nickel, and eluting the interferon in substantially pure form by treating the loaded resin with a washing liquid.

4,551,272

DERIVATIVES OF DIPEPTIDE AND THEIR USE IN DETERMINING THE ACTIVITY OF CARBOXYPEPTIDASE A

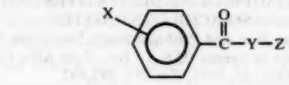
Masami Sugiyama; Hiroko Shibuya, and Yasushi Kasahara, all of Tokyo, Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,849

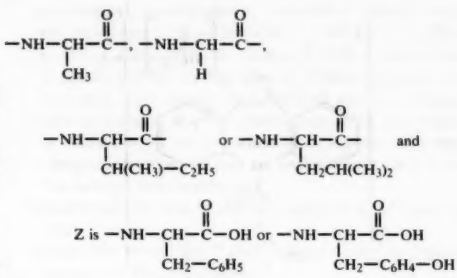
Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 R **6 Claims**

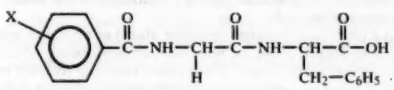
1. A dipeptide derivative having the general formula:



wherein X is OH in ortho or para position, or NH_2 or CH_3O in para position, Y is



excluding however dipeptide derivatives having the general formula:



wherein X is OH or CH_3O.

4,551,273

ANALGESIC PEPTIDE AND PROCESS FOR THE PREPARATION THEREOF

Shinro Tachibana, Kashiwa; Shizuko Ohya, Ushikumachi; Yoshihiro Arakawa, Sakuramura; Takahiro Nakazawa, Fujishiromachi; Takeru Kaneko, Yatabemachi; Masuhiro Ikeda, Toyosatomachi, and Kiyomi Yamatsu, Kamakura, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,804

Claims priority, application Japan, Feb. 1, 1983, 58-13785

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 E **1 Claim**

1. A peptide having the primary structure: N-Me-Tyr-Gly-Gly-Phe-Leu-Arg-Arg-D.Ile-Arg-Pro-Lys-D.Leu-Lys-Trp-NH_2 in which D.Ile and D.Leu represent a D-Ile and a D-Leu residue respectively, other abbreviations of amino acids represent each an L-amino acid residue and Me represents a methyl group.

4,551,274

ELECTROLYTIC TREATMENT OF VEGETABLE PROTEIN

Jerome L. Shen, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 525,513, Aug. 22, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 679,099

Int. Cl.⁴ A23J *1/14*

U.S. Cl. 260—123.5 **32 Claims**

1. A process for the treatment of a vegetable protein material to improve the whiteness thereof comprising:

(a) forming an aqueous slurry of the vegetable protein material having a pH of between about 4.5 and 8 and a proteinaceous solids level of between about 1 and 20% by weight,

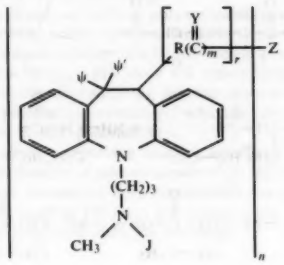
(b) electrolytically reducing said slurry to thereby improve the whiteness of said protein material.

4,551,275
DESMETHYLIMIPRAMINE DERIVATIVES AND POLY(AMINO ACID) CONJUGATES

Marcel R. Pirio, San Jose, and Prithipal Singh, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 23, 1984, Ser. No. 592,492
Int. Cl.[4] C07G *7/00*
U.S. Cl. 260—239 D **19 Claims**

1. A compound of the structure



wherein:

ψ and ψ' are hydrogen atoms or are taken together to form a double bond to an oxygen atom (oxo) when J is other than a hydrogen atom, being a hydrogen atom when Z is poly(amino acid);

Y is a chalcogen (oxygen or sulfur atom) or an imino group;

J is a hydrogen atom, or non-oxo-carbonyl, being non-oxo-carbonyl when ψ and ψ' are taken together to form oxo;

R is a bond or an aliphatic linking group of from 1 to 18 atoms other than hydrogen atoms comprising carbon, nitrogen, and chalcogen (oxygen and sulfur atoms);

Z is an amino group; thiol; thio substituted with alkyl of from 1 to 6 carbon atoms; or poly(amino acid); being a hydrogen atom when r is 0 and ψ and ψ' are taken together to form oxo;

m is 0 or 1;

r is 0 or 1, being 0 when ψ and ψ' are taken together to form oxo, and being otherwise 1;

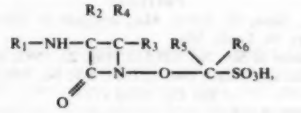
n is 1 when Z is other than poly(amino aid) and is otherwise a number on the average between 1 and the molecular weight of Z divided by 500.

4,551,276
2-OXOAZETIDIN-1-YLOXYMETHYL SULFONIC ACID AND ANALOGS

William A. Slusarchyk, Belle Mead, N.J., and David Kronenthal, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 433,175, Oct. 6, 1982, abandoned. This application Jan. 23, 1984, Ser. No. 573,265
Int. Cl.[4] C07D *205/08, 403/12, 401/12;* **A61K** *31/395*
U.S. Cl. 260—239 A **19 Claims**

1. A β-lactam having the formula

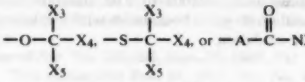


or a pharmaceutically acceptable salt thereof, wherein

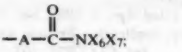
R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2—X_1$, $—S—X_2$, $—O—X_2$,



R_5 and R_6 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, phenyl, subtituted phenyl, cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or R_5 and R_6 together with the carbon atom to which they are attached are cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_5 and R_6 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2—X_1$, $—S—X_2$, $—O—X_2$ or



X_1 is azido, amino, hydroxy, alkanoylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano, $—S—X_2$ or $—O—X_2$;

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, substituted alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl or heteroarylcarbonyl;

one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group;

X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)-carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

A is $—CH=CH—$, $—CH_2—CH=CH—$, $—(CH_2)_{n'}—$, $—(CH_2)_{n'}—O—$, $—(CH_2)_{n'}—NH—$, $—(CH_2)_{n'}—S—CH_2—$;

n is 0, 1, 2 or 3;

n' is 1 or 2; and

X_6 and X_7 are the same or different and each is hydrogen or alkyl, or X_6 is hydrogen and X_7 is amino, substituted amino, acylamino or alkoxy;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one, or more, azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted alkanoyl" refers to a group having the formula (substituted alkyl)

or phenylalkanoyl;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl (of 1 to 4 carbon atoms), alkoxy (of 1 to 4 carbon atoms) or carboxyl groups;

the term "substituted amino" refers to a group having the formula $—NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl,

substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylmethyleneamino, phenylmethyleneamino, substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylmethyleneamino, phenylmethyleneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups.

4,551,277

4-(3-ACYLAMINO-2-OXO-1-AZETIDINYL)-4-OXO-2-BUTENOIC ACID

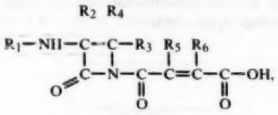
Uwe D. Treuner, Regensburg, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 9, 1983, Ser. No. 550,288

Int. Cl.[4] **C07D** *205/08;* **A61K** *31/395;* **C07D** *403/12, 401/12*

U.S. Cl. 260—239 A **8 Claims**

1. A compound having the formula

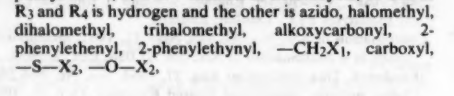


or a pharmaceutically acceptable ester or basic salt thereof, wherein

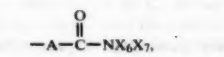
R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, $—CH_2X_1$, carboxyl, $—S—X_2$, $—O—X_2$,



wherein X_1 is azido, amino, hydroxy, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



$—S—X_2$ or $—O—X_2$; X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is $—CH=CH—$, $—(CH_2)_n—$, $—CH_2—O—$, $—CH_2—NH—$ or $—CH_2—S—CH_2—$; n is 0, 1 or 2; and X_6 and X_7 are the same of different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, acylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6, or 7-membered heterocycle; and

R_5 and R_6 are the same or different and each is hydrogen or alkyl;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms:

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or carboxyl groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiazolyl, pyrimidinyl, oxazolyl, triazinyl, or tetrazolyl, or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbons, groups;

the term "a 4,5,6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or to one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbons, groups;

the term "substituted amino" refers to a group having the formula $—NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino.

4,551,278

PREPARATION OF 20-KETO-Δ^{16}-STEROIDS

Albert M. van Leusen, Groningen, and Adriaan M. van Leusen, Winsum, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Apr. 27, 1984, Ser. No. 604,734

Claims priority, application European Pat. Off., Apr. 29, 1983, 83200617.5

Int. Cl.⁴ C07J *5/00*

U.S. Cl. 260—397.4 **19 Claims**

1. A process for the preparation of 20-keto-Δ^{16}-steroids comprising reacting a 17-(isocyanosulfonylmethylene)-steroid with an alkylating agent QR_4 wherein R_4 is an organic group and Q is a group or atom readily displaced with a nucleophile to form a 20-isocyano-20-sulfonyl-Δ^{16}-steroid followed by hydrolysis.

4,551,279

PROTEASE INHIBITORS

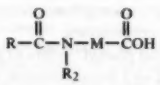
Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jan. 9, 1984, Ser. No. 569,089

Int. Cl.⁴ C07C *103/46*

U.S. Cl. 260—404 **13 Claims**

1. Compounds of the formula:



wherein R is:

(a) alkyl of 15 to 19 carbon atoms, inclusive; being saturated, unsaturated or polyunsaturated;

wherein R_2 is: phenyl or phenyl methyl wherein the phenyl portion may optionally be substituted by Y and Z;

wherein Y and Z each being the same or different are:

(a) hydrogen;
(b) halogen;
(c) alkyl of 1 to 6 carbon atoms, inclusive;
(d) hydroxy;
(e) methoxy;
(f) acetoxy,
(g) carboxylic acid and its alkyl esters of 1 to 6 carbon atoms, inclusive;
(h) nitro; or
(i) phenyl;

wherein M is:

(a) phenyl substituted by X and W;
(b) methylene;

wherein W and X each being the same or different are:

(a) hydrogen;
(b) alkyl of from 1 to 6 carbon atoms, inclusive;
(c) hydroxy;
(d) methoxy;
(e) carboxylic acid and its alkyl esters of from 1 to 6 carbon atoms inclusive;
(f) halogen;
(g) $-NO_2$; or
(h) acetoxy;

wherein when W and X are contiguous they may be taken together to form a phenyl ring; and

wherein W and X may not both be hydrogen.

4,551,280

NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Makoto Sasaki, Okegawa; Haruyoshi Sasaki, Kodaira, and Hisato Sato, Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

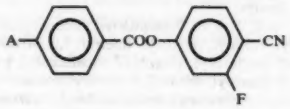
Filed Oct. 28, 1983, Ser. No. 546,534

Claims priority, application Japan, Oct. 30, 1982, 57-191063; Mar. 18, 1983, 58-44329; Mar. 18, 1983, 58-44330

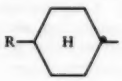
Int. Cl.⁴ C09K *3/34*; C07C *121/52, 121/75, 121/46*

U.S. Cl. 260—465 D **3 Claims**

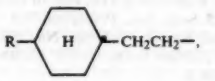
1. A compound of the general formula



wherein A denotes a substituted ring structure represented by the formula



or



the substituent R denotes a linear alkyl group having 1 to 9 carbon atoms, and the cyclohexane rings are both arranged in a trans(equatorial-equatorial)form.

4,551,281

PROCESS FOR THE PREPARATION OF CYCLOPROPANE CARBOXYLIC ACID ESTERS

John Crosby, Manchester, England, assignor to Imperial Chemical Industries PLC, London, England

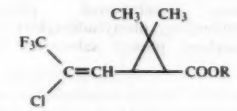
Continuation of Ser. No. 262,640, May 11, 1981, abandoned, which is a continuation of Ser. No. 81,056, Oct. 2, 1979, abandoned. This application Aug. 27, 1984, Ser. No. 644,230

Claims priority, application United Kingdom, Oct. 31, 1978, 42531/78

Int. Cl.⁴ C07C *67/317*

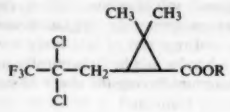
U.S. Cl. 260—465 D **7 Claims**

1. A process for the preparation of a cyclopropane carboxylic acid ester having the general formula:



Formula (I)

wherein R is a lower alkyl, m-phenoxybenzyl, α-cyano-m-phenoxybenzyl or α-ethynyl-m-phenoxybenzyl group, which comprises reacting a compound having the general formula:



Formula II

wherein R has the meanings stated above, with an alkali metal carbonate in a polar aprotic solvent, the alkali metal carbonate being selected from the group consisting of sodium carbonate and potassium carbonate.

4,551,282

TRIPHENYLENE DERIVATIVES

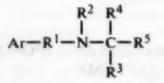
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 31, 1983, Ser. No. 499,331

Int. Cl.⁴ C07C *157/09, 83/08, 91/16, 149/22*

U.S. Cl. 260—501.18 **9 Claims**

1. A compound of formula (I)



wherein Ar is a triphenylene or a triphenylene ring system substituted with halogen, C_{1-6} alkyl, C_{1-6} alkoxy, halo C_{1-6} alkyl, C_{1-6} alkylthio, hydroxy C_{1-6} alkyl, hydroxy C_{1-6} alkylthio, cyano, C_{1-6} alkylsulphinyl or C_{1-6} alkylsulphenyl; R^1 is a C_{1-3} alkylene moiety, R^2 is hydrogen or a C_{1-6} alkyl group; R^3 is a hydroxxy C_{1-6} alkyl group; and R^4 and R^5 are the same or different and are hydrogen, C_{1-6} alkyl groups or hydroxy C_{1-6} alkyl group, or a C_{1-6} alkyl carboxylic acid ester thereof.

4,551,283

PROCESS FOR ISOLATING 2-NAPHTHYLAMINE-3,6,8-TRISULFONIC ACID IN THE FORM OF THE MONOPOTASSIUM OR MONOAMMONIUM SALT

Rudolf Blattner, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba Geigy AG, Basel, Switzerland

Filed Aug. 8, 1984, Ser. No. 638,845

Claims priority, application Switzerland, Aug. 17, 1983, 4486/83

Int. Cl.⁴ C07C *143/56*

U.S. Cl. 260—508 **8 Claims**

1. A process for isolating 2-naphthylamine-3,6,8-trisulfonic acid in the form of the monopotassium or monoammonium salt from the sulfonation mixture resulting from the sulfonation of the corresponding naphthylaminemonosulfonic or -disulfonic acid in oleum, which process comprises starting from a sulfonation mixture which contains the naphthylaminetrisulfonic acid in the form of the monopotassium or monoammonium salt, charging said mixture into water or dilute sulfuric acid such that the concentration of the sulfuric acid in the dilute solution or suspension of the sulfonation mixture is 30 to 77% by weight, simultaneously allowing the temperature to rise to 90° to 125° C., subsequently slowly cooling said solution or suspension to a temperature below 40° C., during said cooling adding at least 0.1% by weight, based on naphthylaminetrisulfonic acid, of a dispersant, and isolating the precipitated monopotassium or monoammonium salt of 2-naphthylamine-3,6,8-trisulfonic acid.

4,551,284

CARBURETOR WITH A SLIDABLE THROTTLE MEMBER CONTROLLING THE AIR INDUCTION PASSAGE

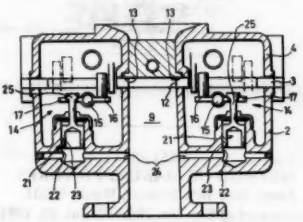
Dieter Stojek, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 9, 1984, Ser. No. 639,276

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1983, 3330235

Int. Cl.⁴ F02M *9/06*

U.S. Cl. 261—44 B **6 Claims**



1. In a carburetor having a slide type throttle member controlling flow through the induction passage, said slide being sealingly and slidably movable laterally on a planar surface extending substantially normal to the induction passage, the slide sealing surfaces being subjected to a vertical downward loading resulting from the pressure differential between a near atmospheric pressure acting on top of the slide and engine intake manifold vacuum acting beneath the slide, and an unloading mechanism responsive to changes in the vacuum below the slide for opposing the vertical downward loading exerted on the guide surface to enable lateral movement of the slide with minimum effort, the improvement comprising,

lifting rail means tiltably mounted for rotation about an axis parallel to the slide surface, roller means rotatably secured to the slide and engaged by one side portion of the lifting rail projecting laterally to one side of the axis for exerting a vertical upward force on the slide upon predetermined pivotal movements of the rail, a manifold vacuum actuated device secured to another portion of the lifting rail projecting laterally to the opposite side of the axis for tilting the rail with a force varying in response to the changes in manifold vacuum, and a further lever arrangement operably connected to the slide and pivotally mounted for an arcuate movement essentially horizontally for moving the slide in opening and closing directions.

4,551,285

FLOTATION MACHINE AND AERATION IMPELLER

Michael A. Jackson, Sacramento, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Feb. 9, 1984, Ser. No. 578,343

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—87 **23 Claims**

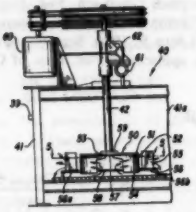
17. A rotatable impeller for a flotation machine, said impeller comprising:

a disc having a central aperture for receiving an air supply;

a series of radially extending and vertically depending blades affixed to bottom portions of said disc; and

wherein said blades include a first radially-inward vane for inducing air from said central aperture to an interblade region and a second radially-outward blade extending to a position adjacent the outer periphery of said disc for

pumping and distributing aerated pulp in a flotation machine, said first vane at its point of intersectin with the



second blade being significantly shorter than the second blade.

4,551,286

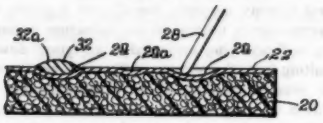
METHOD OF MAKING PICTURES

William A. Jones, Box 189, Everett, Wash. 98201

Continuation-in-part of Ser. No. 284,939, Jul. 20, 1981, Pat. No. 4,499,127. This application Sep. 29, 1982, Ser. No. 426,605

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—1.9 **15 Claims**



1. A method of making a picture comprising the steps, utilizing a sheet having a regular and uniform surface and of predetermined size to correspondingly determine the size of a picture to be made, and presenting said surface to be viewed to an observer, and

applying substances to said surface of the sheet in the form of individually dimensioned and proportioned particles and positioned relative to each other as to form a predetermined picture, and further form a picture independently of and separate from that portion of the sheet that is not covered by the substances and that constitutes a portion of said regular surface,

including the step of preselecting such substances that are transparent and the particles thereby reflect light from the surface thereof that is directed to the observer and reflect, from the opposite surface, light that passes through the first mentioned surface.

4,551,287

METHOD OF MAKING A HOLLOW-CHARGE INSERTS FOR ARMOR-PIERCING PROJECTILES

Karl W. Bethmann, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 23,530

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813588

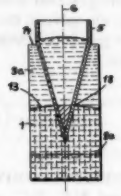
Int. Cl.⁴ C06B *21/00*

U.S. Cl. 269—3 R **12 Claims**

1. A method of making a charge insert for charge shaping in projectiles, comprising the steps of:

(a) disposing a body of an insert-forming metal along a growth axis and inserting therein a rotationally symmetrical shaping member which is generally conical such that the axis of said shaping member lies substantially along said growth axis and commencing at a point inwardly from one end of said body, said member converging toward said point;

(b) progressively melting said body from said one end thereof to said other end thereof and subjecting the melted portion to directional solidification with a directional solidification front progressively displaced along said growth axis from said one end of said body toward the other end thereof whereby said body is transformed into a monocrystalline structure having the shape of said insert; and



(c) removing said member from said body, said member being removed from the monocrystalline body by cooling same below the temperature of said monocrystalline body or by heating said monocrystalline body relative to said member.

4,551,288

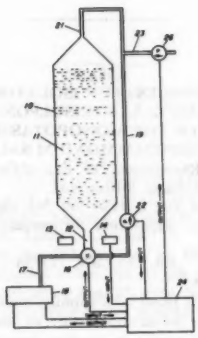
PROCESSES FOR THE PREPARATION OF LIPOSOME DRUG DELIVERY SYSTEMS

Lawrence A. Kelly, Morris Plains, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 408,188, Aug. 16, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,652

Int. Cl.⁴ B01J *13/02;* **A61K** *9/50*

U.S. Cl. 264—4.6 **18 Claims**



1. A process for the preparation of a liposome medicament delivery system which comprises applying an aqueous micellar medicament-detergent-aliphatic lipid-sterol composition to a gel filtration column, monitoring the column effluent to detect the liposome fraction eluted, and collecting the liposome fraction.

10. A continuous process for the preparation of a liposome medicament delivery system which comprises applying an aqueous micellar medicament-detergent-aliphatic lipid-sterol composition to a gel filtration column, monitoring the column effluent to detect the liposome fraction eluted, continuously recycling the non-liposome effluent from the column, while collecting the liposome fraction.

4,551,289

METHOD OF AND APPARATUS FOR MAINTAINING A CONSTANT WALL THICKNESS FOR AN EXTRUDED ARTICLE

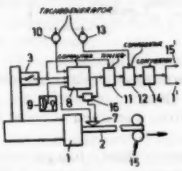
Erwin Schwab, Meinerzhagen; Graziano Parisi, Bad Oeynhausen, and Peter Pander, Düsseldorf, all of Fed. Rep. of Germany, assignors to Battenfeld Extrusionstechnik GmbH, Bad Oeynhausen, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,723

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304865

Int. Cl.⁴ B29D *7/22*

U.S. Cl. 264—23 **17 Claims**



1. A method of operating an extruder for producing a continuous synthetic resin strand having a wall thickness and a width transverse to a direction of extrusion and engaged by a device for drawing said strand from said extruder, said extruder being provided with a measuring cylinder at an upstream end thereof and with a unit for introducing synthetic resin granules into said cylinder, said method comprising the steps of:

(a) at an initial stage in the extrusion of said strand from said extruder, displacing a thickness measuring head trasverse to the direction of extrusion over the entire width of said strand to produce wall thickness measurement signals over this width;

(b) integrating the wall thickness measuring signals to produce a mean value of the wall thickness over said path of said strand;

(c) comparing said mean value with a set point value determined by a weight per unit length of the extruded strand measurement and a measurement of rate of extrusion of said strand to provide a correction value;

(d) continuing the extrusion of said strand from said extruder while measuring the wall thickness of said strand with said head; and

(e) controlling the operation of at least one of said extruder and said device in response to an actual value output of said head corrected by said correction value.

10. In an apparatus for the extrusion of a synthetic resin strand having an extruder from which said strand emerges at a downstream end, a measuring cylinder at an upstream end of said extruder, means for feeding synthetic resin granules into said measuring cylinder and a device engaging said strand for drawing said strand away from said extruder, the improvement which comprises:

a wall thickness measuring head disposed downstream of said extruder for measuring the wall thickness of the extruded strand;

means for displacing said head transverse of said strand for enabling said head to generate wall thickness measuring signals over the entire periphery of said strand;

integrating means for integrating said signals for producing a mean wall thickness value;

means forming a set point value from a measurement of extruded strand weight per unit length and rate of extrusion of the strand;

a comparator for comparing said mean value with said set point value to produce a correction value; and

means for controlling at least one of said extruder and said device continuously in response to an output from said head corrected by said correction value to maintain a minimum wall thickness of the extruded strand.

4,551,290

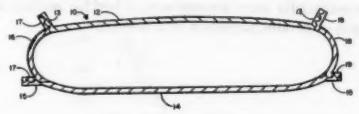
METHOD OF FABRICATING HOLLOW PLASTIC OBJECTS AND APPARATUS THEREFOR

James A. Mizell, 13311 Kelly St., Garden Grove, Calif. 92644

Filed Nov. 21, 1984, Ser. No. 673,570

Int. Cl.⁴ B29D *27/04*

U.S. Cl. 264—46.6 **7 Claims**



1. A process for fabricating a closed, generally flat, object such as a surfboard, said process comprising the following steps:

(a) providing a disassemblable mold having at least four parts comprising a bottom part, a top part and a pair of side rail parts, the interior surface of said mold having the desired shape of the exterior surface of said object;

(b) disassembling said mold and applying a clear gel coat to the interior surface of each said mold part;

(c) applying laminations of a resin and reinforcing material mixture to each of said mold parts;

(d) applying a layer of toluene diisocyanate to at least said top and bottom parts;

(e) subjecting said top and bottom parts to a vacuum until said layers of toluene diisocyanate are each firmly adhered to the respective laminations of said mixture;

(f) affixing the side rail parts to the bottom part and attaching an elongated mold to the side rail parts, said elongated mold having an L-shaped protrusion extending inwardly into the cavity of the mold parts, the bottom part of the "L" directed toward the center of the cavity;

(g) coating the interior of the cavity and the inwardly facing portion of the L-shaped portion of the elongated mold with a resin and reinforcing material mixture thereby forming an L-shaped step along the edge of the opening of said cavity;

(h) allowing the resin mixture to become structurally strong and removing the elongated mold thereby exposing an L-shaped step about the opening in said cavity;

(i) applying strips of resin and reinforcing material mixture to said L-shaped step and closing said cavity by connecting said top part to said rail parts; and

(j) allowing the resulting assembly to cure.

4,551,291

SURFACE IMPROVEMENT OF SEMICONDUCTORS IN HIGH SPEED CASTING

G. Felix Wakefield, Woodland Hills; David L. Bender, and Samuel N. Rea, both of Thousand Oaks, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

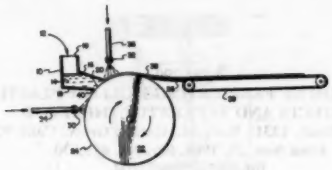
Continuation of Ser. No. 391,210, Jun. 23, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 540,692

Int. Cl.⁴ B29D *7/00*

U.S. Cl. 264—104 **7 Claims**

1. In a method of producing semiconductor ribbon material in which a body of molten semiconductor material is brought

into contact with a moving chill surface in a substantially inert atmosphere;



the improvement comprising injecting water vapor into said substantially inert atmosphere, whereby surface smoothness of produced ribbon is improved.

4,551,292

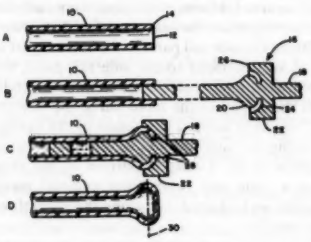
METHOD FOR MAKING A CATHETER WITH A SOFT, DEFORMABLE TIP

Bruce W. Fletcher, Plymouth; Mark A. Rydell, Excelsior, and Edward W. Reese, Maple Grove, all of Minn., assignors to Angiomedics, Inc., Plymouth, Minn.

Filed Apr. 5, 1984, Ser. No. 596,919

Int. Cl.[4] B29C *17/02*

U.S. Cl. 264—139 **8 Claims**



1. A method of forming a soft, deformable tip on the distal end of a tubular thermoplastic or elastomeric catheter, comprising the steps of:

(a) providing a tubular, thermoplastic or elastomeric catheter;

(b) providing a forming tool having a cylindrical wire member of an outside diameter approximately equal to the diameter of the lumen of said tubular catheter and a protuberance of a predetermined shape symmetrically disposed on said wire member;

(c) inserting said forming tool into the lumen of said catheter at its distal end;

(d) advancing said forming tool into said lumen until said protuberance enters said lumen to expand the thermoplastic material about said protuberance;

(e) heating said distal end of said catheter containing said protuberance to the softening point of the thermoplastic employed to create a preferential fold-line in the expanded portion of said distal end of said catheter;

(f) cooling said distal end of said catheter below the softening point of the plastic; and

(g) extracting said forming tool from said lumen.

4,551,293

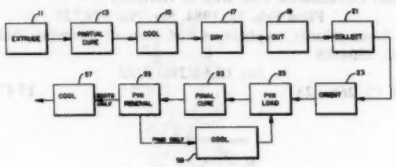
METHOD OF FORMING SPARK PLUG BOOTS

Larry F. Diehl, Jr., and Robert M. Gibbon, both of Fort Worth, Tex., assignors to Jamak, Inc., Weatherford, Tex.

Filed Mar. 5, 1984, Ser. No. 586,337

Int. Cl.[4] B29H *5/01*

U.S. Cl. 264—150 **6 Claims**



1. A method of forming a tubular elastomeric member with at least one internal shoulder, comprising:

extruding a tube from a selected uncured elastomeric material; then

heating the tube to vulcanize it to a partially cured condition to increase the hardness of the tube sufficiently to enable it to be cut and stretched a selected amount;

cutting the tube into individual tubular members;

placing each piece of the tubular member into a bore of a carrier;

providing a pin with a base and a tip of smaller diameter than the base but with greater diameter than the inner diameter of the tubular member and at least one external shoulder, and providing the pin with a bleed off passage leading from the external shoulder to the exterior of the pin;

inserting the pin into the tubular member while simultaneously applying air pressure into the tubular member to expand and stretch the tubular member over the pin, allowing trapped air to bleed off through the bleed off passage, with the carrier limiting the expansion of the tubular member due to the air pressure; then

removing the pin from the bore of the carrier with the tubular member stretched thereon and heating the pin and tubular member to vulcanize the tubular member to a desired cure, retaining an internal shoulder in the tubular member at the point of the external shoulder of the pin; and

stripping the tubular member from the pin and cooling the tubular member.

4,551,294

MOLDING COMPOSITION BASED ON VINYL CHLORIDE POLYMERS, AND PROCESS FOR THE MANUFACTURE OF FILMS FROM THESE MOLDING COMPOSITIONS FOR THE PRODUCTION OF FORGERY-PROOF VALUABLE DOCUMENTS

Bernhard Wottka, Kastl, and Alfred Weindl, Altötting, both of Fed. Rep. of Germany, assignors to Heochst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 4, 1984, Ser. No. 657,690

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336647

Int. Cl.[4] B29D *7/14;* **C08L** *1/02, 27/06*

U.S. Cl. 264—175 **4 Claims**

1. A molding composition based on vinyl chloride polymers, for the manufacture of films for the production of forgery-proof valuable documents, consisting essentially of

A. 5 to 20% by weight of an impact strength modifier for vinyl chloride polymers, selected from the group comprising the acrylonitrile/butadiene/styrene polymers, methyl methacrylate/butadiene/styrene polymers, methyl methacrylate/acrylonitrile/butadiene/styrene polymers, each of said polymers having a butadiene content of at least about 35% by weight relative to the total polymer, and chlorinated ethylene polymer, said chlorinated ethylene poly-

mer having a chlorine content of about 20 to 50% by weight relative to the chlorinated ethylene polymer and having a mean molecular weight of about 10,000 to 100,000 when calculated from the chlorine content and the molecular weight of the starting ethylene polymer as determined by gel chromotography;

B. 0.5 to 25% by weight of powdered pure cellulose which has a mean degree of polymerization of 300 to 1,000 and the particles of which have a maximum diameter of 0.09 mm;

C. 1 to 5% by weight of polymethyl methacrylate; and

D. vinyl chloride polymer having at least about 70% by weight polymerized vinyl chloride units relative to the weight of the polymer, in such a quantity that the sum of the weights of said components A, B, C and D gives 100% by weight; and additionally

E. about 0.1 to 2.5% by weight of lubricant and about 0.5 to 3% by weight of heat stabilizer for said vinyl chloride polymer, both relative to the quantity by weight of said component D.

4. A process for the manufacture of calendered films from the molding compositions as claimed in claim 1, which comprises pre-gelling the molding composition at a temperature from 150° to 170° C., and calendering the pre-gelled material on a calender comprising four or five calender rolls at a temperature from 190° to 210° C. to give a film, the rolls being heated individually in such a way that the first and last rolls have approximately the same temperature and the intervening rolls have temperatures which are 5° to 10° C. higher than those of the other two rolls.

4,551,295

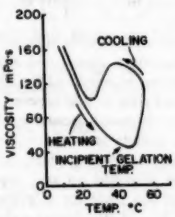
PROCESS FOR MIXING AND EXTRUDING CERAMIC MATERIALS

Robert W. Gardner, Big Flats; Donald L. Guile, Horseheads, and Merrill Lynn, Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 26, 1984, Ser. No. 604,374

Int. Cl.⁴ B29B 1/10

U.S. Cl. 264—177 R **12 Claims**



1. In the method for making ceramic articles of widely-differing profiles and shapes by providing a plastically-deformable batch comprising a mixture of particulate ceramic material, water, a binder/plasticizer, and, an extrusion aid, charging the batch into an extrusion apparatus to mix, de-air, convey, and force the batch through a die having a desired configuration, the improvement which comprises including a gel-type binder/plasticizer having a viscosity at 20° C. between 25,000–100,000 centipoises in said batch and utilizing a twin screw extrusion apparatus wherein the screws of said apparatus are self-cleaning, intermeshing, and co-rotating to mix, de-air, convey, and force the batch through a die at working temperatures greater than 35° C.

4,551,296

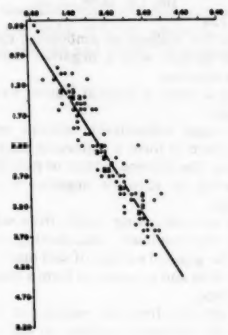
PRODUCING HIGH TENACITY, HIGH MODULUS CRYSTALLINE ARTICLE SUCH AS FIBER OR FILM

Sheldon Kavesh, Whippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 359,020, Mar. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 259,266, Apr. 30, 1981, abandoned. This application Jan. 20, 1984, Ser. No. 572,607

Int. Cl.⁴ D01F 6/00

U.S. Cl. 264—177 F **30 Claims**



1. A process for producing a high strength, high modulus shaped thermoplastic article of substantially indefinite length which comprises the steps:

(a) forming a solution of a thermoplastic crystalline polymer selected from the group consisting of polyethylene, polypropylene, polyoxymethylene, polybutene-1, poly(vinylidene fluoride) and poly(4-methylpentene-1) in a first, non-volatile solvent at a first concentration of about 2 to 15% by weight of polymer per unit weight of first solvent, said thermoplastic polymer having a weight average molecular length between about 7×10^4 and about 71×10^4 backbone atoms and the solubility of said thermoplastic polymer in said first solvent at a first temperature being at least said first concentration;

(b) extruding said solution through an aperture, said solution being at a temperature no less than said first temperature upstream of the aperture and being substantially at the first concentration both upstream and downstream of the aperture;

(c) cooling the solution adjacent to and downstream of the aperture to a second temperature below the temperature at which a gel is formed to form a gel containing first solvent of substantially indefinite length;

(d) extracting the gel containing first solvent with a second, volatile solvent for a sufficient contact time to form a gel containing second solvent which gel is substantially free of first solvent and is of substantially indefinite length;

(e) drying the gel containing second solvent to form a xerogel of substantially indefinite length free of first and second solvent; and,

(f) stretching at a sufficient temperature at least one of:

(i) the gel containing the first solvent,

(ii) the gel containing the second solvent and,

(iii) the xerogel

at a total stretch ratio:

(i) in the case of polyethylene which is sufficient to achieve a tenacity of at least about 20 g/denier and a modulus of at least about 600 g/denier,

(ii) in the case of polypropylene which is sufficient to achieve a tenacity of at least about 10 g/denier and a modulus of at least about 160 g/denier, and

(iii) in the case of polyoxymethylene, polybutene-1, poly(-

vinylidene fluoride) or poly(4-methylpentene-1) of at least about 10:1.

4,551,297

METHOD OF MAKING AN EMBOSSING CYLINDER

Hugo Bötcher, Hanover; Klaus Heimrich, Garbsen; Gustav Hildebrandt, Auetal; Heinrich Kracke, Lehrte, and Johannes Richter, Celle, all of Fed. Rep. of Germany, assignors to J. H. Benecke GmbH, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,126

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333179; Feb. 20, 1984, 3405985

Int. Cl.[4] B29C *1/02*

U.S. Cl. 264—224 **11 Claims**

1. A method for making an embossing cylinder having a silicone rubber surface with a negative impression of grain design which comprises

(a) providing a sheet of natural leather having the desired grain design,

(b) pouring liquid vulcanizable silicone rubber on to the grained surface to form a uniformly thick coating,

(c) vulcanizing the silicone rubber to provide an embossing matrix having an accurate negative impression of said grain design,

(d) stripping said embossing matrix from said leather sheet,

(e) laying a thermoplastic film, having opposed parallel edges, on the grained surface of said matrix and subjecting the film to heat and pressure to form a positive impression on the surface,

(f) stripping the film from the matrix and forming it into a tube with the embossed surface on the outside and said parallel edges abutting,

(g) placing said embossing matrix over said abutting edges and the marginal area on either side thereof,

(h) subjecting the film beneath said matrix to heat and pressure to overemboss the previously embossed surface in said marginal areas,

(i) pouring vulcanized silicone rubber on the embossed surface to form a uniformly thick blanket,

(j) vulcanizing the silicone rubber blanket,

(k) stripping the blanket from the embossed surface, and

(l) adhering the blanket, embossed side out, to the surface of a cylinder.

4,551,298

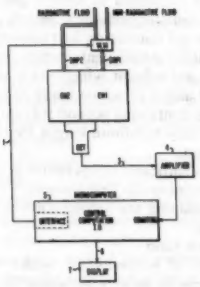
RADIATION MONITORING APPARATUS

Norman P. Goldstein, Murrysville, Pa., and Stephen A. Lane, Cockeysville, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1982, Ser. No. 382,434

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—245 **24 Claims**



1. A radiation monitor system comprising two chambers and radiation detector means adapted to be responsive to radioactive fluid present in said chambers and to existing radioactive background; means being provided for comparing the responses of said radiation detector means in a first mode of operation when radioactive fluid is contained in at least one of said chambers and in a second mode of operation when radioactive fluid is contained in the other of said chambers, whereby information free from said radioactive background is derived from said comparing means.

4,551,299

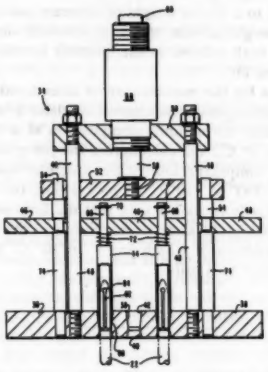
MULTIPLE FUEL ROD GRIPPER

Edward P. Shields, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1982, Ser. No. 418,141

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—261 **11 Claims**



1. A multiple fuel rod gripper for extracting nuclear fuel rods from a nuclear fuel assembly comprising:

a locking plate having a plurality of tapered holes therein corresponding to the arrangement of fuel rods to be extracted from a fuel assembly;

a plurality of attachment rods connected to said locking plate;

a support plate connected to said attachment rods;

a top plate slidably disposed on said attachment rods between said support plate and said locking plate;

a plurality of shafts independently slidably disposed through said top plate;

a plurality of metallic flexible substantially cylindrical hollow collets having a closed end attached to one of said shafts and having an open end for accepting and gripping one of said fuel rods in said tapered holes;

a biasing means disposed around each of said shafts and between said collets and said top plate for urging said collets toward said locking plate; and

actuating means disposed on said support plate and connected to said top plate for selectively moving said top plate relative to said attachment rods thereby forcing said collets into said tapered holes for gripping said fuel rods.

4,551,300

NUCLEAR REACTOR FUEL ASSEMBLY END FITTING

Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

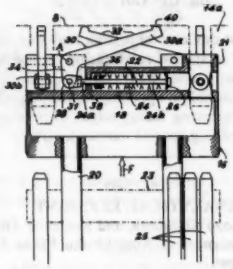
Filed Jan. 10, 1983, Ser. No. 456,739

Int. Cl.[4] G21C *3/30*

U.S. Cl. 376—364 **7 Claims**

1. A nuclear reactor fuel assembly end fitting comprising a frame having sides, a closed recess provided in each side of said frame, elastic means contained in each closed recess, a plurality of elongate levers, the number of levers being equal to the

number of sides of the frame, each lever having a first end adapted to bear against a reactor vessel element and a second end, said lever being spaced from said elastic means, the cross-section of the lever increasing from said first end to said second end for maintaining stress per unit of lever cross-sectional area essentially constant, pivot axis forming means pivotally connected to each lever between said lever first and second ends



and mounted on said frame for pivotally connecting each lever to said frame, coupling means connecting each of said lever second ends to a corresponding elastic means and spacing each of said levers from said corresponding elastic means for separating each of said levers from said corresponding elastic means, said elastic means exerting a restoring torque on the corresponding lever via said coupling means.

4,551,301

SINTERED COMPOUND MATERIAL FOR ELECTRICAL CONTACTS AND METHOD FOR ITS PRODUCTION

Horst Schreiner, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 7, 1984, Ser. No. 577,748

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305270

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—21 **18 Claims**

1. In a sintered compound material of silver, stannic oxide, bismuth oxide and copper oxide ($AgSnO_2Bi_2O_3CuO$) for use as an electrical contact, wherein the mean particle sizes of the stannic oxide, bismuth oxide and copper oxide in the silver material structure zones are between 0.1 and 5 μm, and wherein the stannic oxide share is between 6 and 15 percent by weight, and both the bismuth oxide share and the copper oxide share are each between 0.2 and 2 percent by weight, the improvement wherein the material contains at least one other metal oxide additive which sublimes below the melting temperature of silver and which forms a share of the material between 0.2 and 2 percent by weight; wherein the stannic oxide, the bismuth oxide and the copper oxide are globularly precipitated in silver material structure zones having a maximum diameter of 200 μm; and wherein the metal oxide additive is distributed on the surface of these structure zones of silver, stannic oxide, bismuth oxide and copper oxide.

4,551,302

DENTAL ALLOY BASED ON PALLADIUM FOR THE PRODUCTION OF FIXED AND REMOVABLE DENTAL CONSTRUCTIONS

Rudolph Wagner, Remchingen, and Harry Schiwiora, Pforzheim, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,701

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316595

Int. Cl.[4] C22C *5/04*

U.S. Cl. 420—464 **3 Claims**

1. A dental alloy suitable for the production of fixed and removal dental constructions consisting essentially of 65–80% palladium, 0.5–5% gold, 0.5–5% platinum, 3–8% copper, 4–8% gallium, 4–9% tin and 0.2–0.7% rhenium or 0.7–0.9% ruthenium.

4,551,303

METHOD OF USING AN EVAPORATION SOURCE

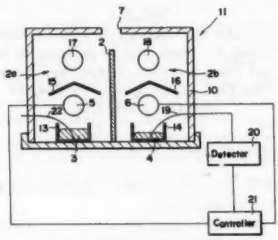
Hiroyuki Moriguchi, Koufu; Masanori Matsumoto, Hachioji; Akira Nishiwaki, Hachioji; Yasuo Morohoshi, Hachioji, and Hiroyuki Nomori, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,215

Claims priority, application Japan, Sep. 4, 1982, 57-154240; Sep. 4, 1982, 57-154241

Int. Cl.[4] C22C *28/00*

U.S. Cl. 420—590 **11 Claims**



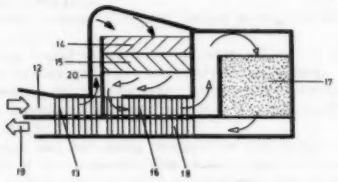
1. A method of using an evaporation source designed so that two or more materials to be evaporated are heated to evaporate by respective heaters comprising detecting the temperature of material to be evaporated contained in each of a plurality of receptacles for holding materials to be evaporated, detecting the temperature of the material to be evaporated having the slowest evaporation rate, and controlling at least one heater associated with each of said receptacles and providing the energy for evaporation of the material contained in that receptacle to maintain the power delivered to each of such heaters constant as long as the temperature of said material with the slowest evaporation rate remains constant.

4,551,304

METHOD OF CLEANING AIR LOADED WITH POLLUTANTS

Heinz Hölter, Beisenstr. 39-41, 4390 Gladbeck; Heinrich Igelbüscher, Gladbeck; Heinrich Gresch, Dortmund-Wickede, and Heribert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Heinz Hölter, Gladbeck, Fed. Rep. of Germany

Division of Ser. No. 387,853, Jun. 4, 1982, Pat. No. 4,451,435.
This application May 14, 1984, Ser. No. 610,246
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039238; Nov. 11, 1980, 3042455; Jan. 31, 1981, 3103302; Jan. 31, 1981, 3103303; Jul. 9, 1981, 3127129; PCT Int'l Appl., Sep. 30, 1981, PCT/EP81/00153
Int. Cl.[4] A61L *9/00*
U.S. Cl. 422—4 **16 Claims**



9. A method of cleaning air contaminated with at least one toxic substance for supply to a cabin adapted to be occupied by a person and utilizing a gas filter whereby the air before entry into the filter is subjected to a heating and after leaving the filter and before entering the cabin is subjected to a cooling, said method comprising the steps of:

partially heating the air to a temperature of 20° to 30° C. before the air enters the filter;

contacting the partially heated air with a sorption layer of the filter which is constituted as a multilayer filter to reduce toxic substance content of the air;

thereafter further heating the air to a temperature of 55° to 60° C.;

passing the further heated air through a catalyst layer of said multilayer filter to further reduce the toxic substance content of the air;

cooling the air after it has traversed said catalyst layer; and introducing the cooled air into said cabin.

4,551,305

REDUCTION OF ORGANIC WASTE ODORS

Randall B. Nelson, Olympia, Wash., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,384
Int. Cl.[4] A61L *9/00*
U.S. Cl. 422—5 **13 Claims**

1. A amine and ammonia odor reducing formulation, comprising:

(a) spent sulfite liquor containing substantially undegraded lignosulfonates and sugars;

(b) 1.0 to 15.0% by weight of acetic acid, based upon the solids content of the spent sulfite liquor;

(c) 0.5 to 10.0 grams of phenolic carbonyl compound per liter of said reducing formulation; and

(d) an alkaline pH-modifying substance in an amount sufficient to adjust the pH to a value of from 6.5 to 8.0.

10. A process for reducing amine and ammonia odors of organic waste material, which comprises contacting said organic waste material with a reaction mixture comprising:

(a) spent sulfite liquor containing substantially undegraded lignosulfonates and sugars;

(b) 1.0 to 15.0% by weight of acetic acid, based upon the solids content of the spent sulfite liquor;

(c) 0.5 to 10.0 grams of phenolic carbonyl compounds per liter of such reaction mixture; and

(d) an alkaline pH-modifying substance in an amount sufficient to adjust the pH to a value of from 6.5 to 8.0.

4,551,306

SEALED REAGENT MATRIX

Dale W. Bouwman, and Harold K. Clayborn, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 20, 1983, Ser. No. 496,452
Int. Cl.[4] G01N *33/52*
U.S. Cl. 422—56 **7 Claims**

1. A reagent test device comprising multiple reagent carrier matrices attached in spaced relationship to one side of a substrate, said reagent carrier matrices being impregnated with water repellent material on opposing facing edges in an amount sufficient to seal opposing facing edges to prevent liquid runover between adjoining spaced carrier matrices.

4,551,307

ANALYTICAL ELEMENT

Mikio Koyama; Shozo Kikugawa, and Kenichiro Okaniwa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,794
Claims priority, application Japan, May 28, 1981, 56-82372
Int. Cl.[4] G01N *33/52, 33/54*
U.S. Cl. 422—56 **23 Claims**

1. An analytical element for detecting a component in a liquid sample, said analytical element containing a light-transmissive and liquid-impermeable support and at least one developing layer having a fibrous structure, said fibrous structure comprising fibers which are loose and randomly entangled with each other in said at least one developing layer, said fibers having a size of from 50 to 325 mesh,

said at least one developing layer containing at least one interactive composition capable of reacting with said component to be detected and said interactive composition being bound to the fibers of said developing layer through a compound having a first reactive group for binding to said fibers and a second reactive group for binding to said interactive composition, and a portion of said reactive groups of said compound being bound to at least one of each other and groups in a binder or adjacent layers, thereby increasing the mechanical strength of the developing layer of fibrous structure and greatly enhancing adhesion to the adjacent layers.

4,551,308

APPARATUS FOR ANALYZING THE INFLUENCE OF ADDITIVE REAGENTS UPON THE COAGULATION OF BLOOD AND RELATED METHODS

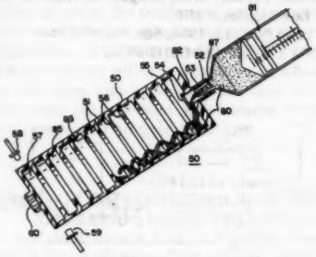
Michael D. Mintz, Edison, N.J., assignor to International Technidyne Corp., Edison, N.J.

Division of Ser. No. 281,661, Jul. 9, 1981, Pat. No. 4,443,408.
This application Dec. 23, 1983, Ser. No. 549,070
Int. Cl.[4] G01N *21/03, 21/75, 33/86*
U.S. Cl. 422—58 **4 Claims**

1. An article of manufacture for use as a blood specimen sample holder in performing optical analysis of the coagulation time of a blood sample, comprising:

a longitudinal tubular member fabricated from a transparent rigid plastic having a surface roughness adhesiveness for clotted blood to permit clotted blood to adhere to it, said longitudinal tubular member being symmetrically disposed about an axis and having a closed bottom and an opened top for receiving a blood sample, said member having a plurality of annular walls disposed about the inner surface to form a plurality of chambers with said walls each of a predetermined height and relatively concentric to form a blood sample passageway from the opened top to the closed bottom, whereby when a blood sample is introduced into said opened top and said mem-

ber is tilted from the horizontal blood will flow into a first chamber until it is filled and overflow over said associated



wall into the next chamber and so on until each of said chambers contains a sample pool of said blood.

4,551,309

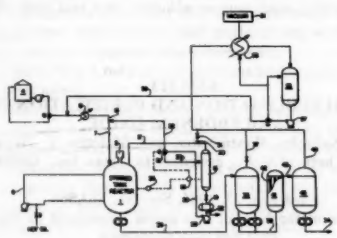
APPARATUS FOR PRODUCING STYRENIC/ALKENYLNITRILE COPOLYMERS

Jeffrey D. Morris, and Robert A. Fuller, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 422,767, Sep. 24, 1982, abandoned. This application Oct. 3, 1983, Ser. No. 538,235

Int. Cl.[4] C08G *18/32, 18/60*

U.S. Cl. 422—135 **13 Claims**



1. An apparatus for the continuous mass polymerization of styrenic and alkenylnitrile monomers to produce a styrenic-/alkenylnitrile copolymer, comprising:

a reaction vessel;

means for continuously introducing a feed comprising a predetermined ratio of styrenic and alkenylnitrile monomers into said reaction vessel to produce a reaction mixture;

means for subjecting the reaction mixture containing styrenic and alkenylnitrile monomers to conditions of temperature and pressure under which said monomers copolymerize to produce a styrenic/alkenylnitrile copolymer;

means for subjecting the reaction mixture to agitation sufficient to maintain a substantially uniform composition distribution and a substantially uniform temperature distribution throughout the reaction mixture;

means for continuously withdrawing styrenic/alkenylnitrile copolymer from the reaction vessel; and

a devolatilizer for removing volatile components from the styrenic/alkenylnitrile copolymer withdrawn from the reaction vessel, wherein said devolatilizer comprises a first stage comprising means for restoring in the withdrawn copolymer the ratio of styrenic to alkenylnitrile monomers to approximately the same ratio as the predetermined styrenic:alkenylnitrile ratio of the feed including means for maintaining the pressure of the first stage devolatilizer at a level sufficient to provide a monomer-containing vapor phase and means for selectively venting alkenylnitrile monomer-rich vapor; and

a second stage comprising means for heating the withdrawn styrenic/alkenylnitrile copolymer to a temperature sufficient to volatilize substantially all of the volatile components therein, and means for separating the volatilized component from the non-volatilized copolymer.

4,551,310

CONTINUOUS VACUUM TREATING APPARATUS

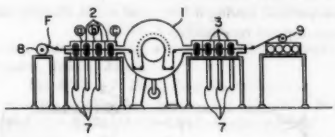
Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Hirokazu Nomura, Ibaraki; Masaie Tohkai, Ibaraki; Yoshitada Hata, Matsudo, and Kenichi Kato, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 288,502, Jul. 30, 1981, abandoned. This application Mar. 27, 1984, Ser. No. 593,964

Claims priority, application Japan, Jul. 30, 1980, 55-103630

Int. Cl.[4] B01J *19/08, 19/12;* **B05C** *3/132*

U.S. Cl. 422—186.05 **14 Claims**



1. A continuous vacuum treating apparatus adapted to treat a flexible plastic film, the apparatus comprising: a vacuum treating chamber, at least one auxiliary vacuum chamber disposed at each of an upstream and a downstream side of said vacuum treating chamber, the auxiliary vacuum chambers each including a case and a pair of opposed seal rolls arranged for pressing said film between the nip of said rolls, one of said seal rolls in wholly made of a metal while the other of said seal rolls has a metallic core and an elastic member on an outer surface of said metallic core, means for effecting seals between said seal rolls and said case along an entire axial length of said rolls including ripple members constituted by elastic members coated with a film of a material having a low friction coefficient, means for effecting seals between both end surfaces of said seal rolls and said case including side pieces for contacting both ends of said seal rolls and at least a pressure adjusting means for pressing one of said side plates against associated end surfaces of said seal rolls, and said apparatus further comprising means for driving at least one of said seal rolls of each of said pairs of seal rolls of the auxiliary vacuum chambers, said driving means including means for adjusting the driving speed of the seal rolls of said upstream auxiliary vacuum chamber and the seal rolls of said downstream auxiliary vacuum chamber with respect to each other, and vacuum pump means for evacuating said vacuum treating chamber and said auxiliary vacuum chambers.

4,551,311

STERILIZER CONTAINER

Jürgen W. Lorenz, Munich, Fed. Rep. of Germany, assignor to Georg Wagner KG, Munich, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,179

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1981, 3146349

Int. Cl.[4] A61L *2/06;* **B65D** *51/16*

U.S. Cl. 422—300 **16 Claims**

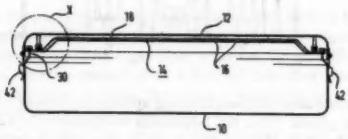
1. A sterilizer container comprising:

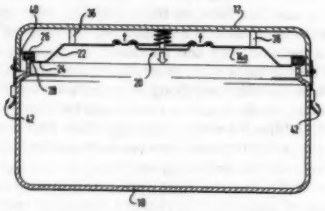
a base portion having a floor and walls, thereby defining an open-topped receptacle; an intermediate cover including means to engage the periphery of the walls of said base portion in sealing relationship therewith before, during and after the container is subjected to sterilization, said

intermediate cover forming with said base portion an interior chamber, and said intermediate cover including means to permit fluid communication therethrough; an outer solid cover dimensioned to overlie said intermediate cover in spaced relationship therefrom; filter means associated with said intermediate cover for preventing passage of microbial contamination into said interior chamber through said fluid communication means in said intermediate cover before, during, and after the container is subjected to sterilization; means supporting said outer cover in spaced relationship to said intermediate cover, to form a space therebetween, and in spaced relationship to said base portion engaging means; and means at the periphery of said outer cover forming with said base portion engaging means a flow passage therebetween, wherein said flow passage and the space between said intermediate cover and said outer cover define a tortuous path for the passage of an exteriorly generated sterilizing fluid to the upstream side of said filter means, the interior chamber being in fluid communication with said tortuous path through said filter means and said fluid communication means.

16. A sterilizer container comprising:

a base portion having a floor and walls, thereby defining an open-topped receptacle;





an intermediate cover including means to engage the periphery of the walls of said base portion in sealing relationship therewith before, during, and after the container is subjected to sterilization, said intermediate cover forming with said base portion an interior chamber;

an outer solid cover dimensioned to overlie said intermediate cover in spaced relationship therefrom;

valve means within said intermediate cover for selectively permitting the passage of fluids through said intermediate cover and into and out of said interior chamber before, during, and after the container is subjected to sterilization;

means supporting said outer cover in spaced relationship to said intermediate cover, to form a space therebetween, and in spaced relationship to said base portion engaging means; and

means at the periphery of said outer cover forming with said base portion engaging means a flow passage therebetween, wherein said flow passage and the space between said intermediate cover and said outer cover define a tortuous path for the passage of an exteriorly generated sterilizing fluid to the upstream side of said valve means, the interior chamber being in fluid communication with said tortuous path through said valve means.

4,551,312

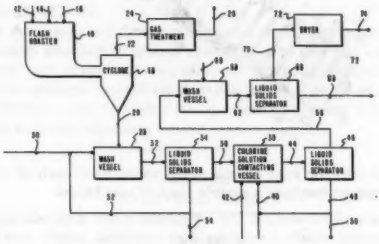
PROCESS FOR CONVERTING MOLYBDENITE TO MOLYBDENUM OXIDE

William A. Yuill, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 13, 1984, Ser. No. 670,244

Int. Cl.[4] C01G *39/02*

U.S. Cl. 423—53 **8 Claims**



1. A process for converting molybdenite to molybdenum oxide, said process comprising;

(a) flash roasting said molybdenite in a flash roasting zone to produce a molybdenum calcine comprising molybdenum oxide and minor quantities of residual sulfur;

(b) intimately contacting said molybdenum calcine with a free chlorine-containing aqueous solution for a time in excess of about 2 hours to remove at least a major portion of said residual sulfur from said molybdenum calcine; and,

(c) separating said aqueous solution from said molybdenum oxide.

4,551,313

FLASH SUBLIMATION AND PURIFICATION OF MOLYBDENUM OXIDE

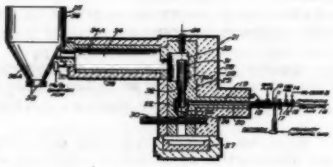
Bruce J. Sabacky, Westminster, and Malcolm T. Hepworth, Golden, both of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 27, 1984, Ser. No. 583,566

The portion of the term of this patent subsequent to Nov. 26, 2002 has been disclaimed.

Int. Cl.[4] C01G *39/02*

U.S. Cl. 423—59 **6 Claims**



1. A process for flash-sublimation of molybdic oxide containing slag-forming constituents which comprises,

feeding a pneumatically suspended stream of particulate molybdic oxide and a mixture of fuel and oxidizing gases through a nozzle into a confined furnace chamber,

said fuel gas-oxidizing gas mixture exiting from said nozzle being ignited to provide a flame thereof,

maintaining said flame at a condition to provide a temperature in the range of 1600° C.±200° C. to about 1800° C. in said furnace chamber sufficient to sublime said molybdic oxide, and to melt slag-forming constituents in said molybdic oxide collecting liquid slag formed in said furnace chamber,

causing the resulting gases and any suspended solids includ-

ing the sublimed molybdenum trioxide to flow from said furnace chamber to and through a condensing chamber, the temperature of said condensing chamber being controlled to above the condensing temperature of said sublimed molybdenum trioxide but below the volatilization temperature of volatile metal-containing impurities present and thereby effect a separation of the molybdenum trioxide from said impurities, and then condensing and recovering the separated molybdenum trioxide as solids while separating off-gases therefrom.

4,551,314

PROCESS FOR IMPROVING SOLVENT EXTRACTION OPERATION USING TWO MIXERS

Leo W. Beckstead, Arvada; Linn D. Havelick, Westminster, and Robert F. Hogsett, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Apr. 11, 1984, Ser. No. 599,127
Int. Cl.[4] C01G *41/00*
U.S. Cl. 423—54 **11 Claims**

1. In a solvent extraction stripping system comprising an aqueous stripping phase of an ammonium hydroxide solution and an immiscible organic phase containing tungsten values by virtue of an amine extractant contained in said immiscible organic, wherein said two phases are fed to and through the system at a net volume ratio R of aqueous to organic and mixed together to effect extraction of said tungsten values by said aqueous phase with the aqueous phase continuous, and wherein said aqueous phase is characterized by entraining substantial amounts of said tungsten-containing organic phase during mixing which adversely affects the subsequent processing of the aqueous phase and adversely affects the subsequent disengagement rate between said phase during separation by settling, the improvement which comprises,

(a) establishing a bath of said aqueous and organic phases in a first mixer,

(b) starting the mixing thereof with the aqueous phase predominant during the initial stages of mixing and thereby produce a mixture with the aqueous phase continuous,

(c) passing said mixed phases to a second mixer and starting the mixing thereof with the organic phase predominant during the initial stage of mixing and thereby produce a mixture with the organic phase continuous,

(d) maintaining the net flow of the phases through the system at said net volume ratio R of aqueous to organic,

(e) passing said mixed phases from said second mixer to a settler,

whereby the rate of disengagement of the phases is substantially increased and the aqueous phase substantially impoverished in entrained organic phase, and

(f) continuing feeding said phases through the system at said net volume ratio R of aqueous to organic.

4,551,315

RECOVERING VANADIUM VALUES FROM AMMONIUM BICARBONATE SOLUTION

Paul J. Marcantonio, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

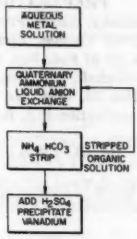
Filed Nov. 26, 1984, Ser. No. 675,093
Int. Cl.[4] C01G *31/00*
U.S. Cl. 423—67 **6 Claims**

1. A method of recovering vanadium values from an aqueous ammonium bicarbonate solvent extraction strip solution comprising:

(a) adding sulfuric acid to the aqueous ammonium bicarbonate strip solution containing vanadium values and adjusting the pH of the strip solution with said acid to a range of from 2 to 6;

(b) removing CO_2 formed from the decomposition of ammonium bicarbonate from the solution;

(c) adding ammonia or ammonium hydroxide or a mixture thereof to the strip solution in order to bring the pH of the strip solution in the range of from 6.5 to 8.5; and



(d) separating the vanadium metal values from the strip solution.

4,551,316

PROCESS FOR PRODUCING BORON NITRIDE OF CUBIC SYSTEM

Eiichi Iizuka, Shiojiri, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,609
Claims priority, application Japan, Nov. 12, 1981, 56-181391
Int. Cl.[4] B01J *21/02*; C01B *35/00, 21/064*
U.S. Cl. 423—290 **11 Claims**

1. A process for producing boron nitride of the cubic system, which comprises the steps of:

maintaining a mixture of (i) a finely divided lithium nitride (Li_3N) or metallic lithium powder, (ii) a finely divided powder of at least one alkaline earth metal nitride or alkaline earth metal selected from the group consisting of calcium nitride (Ca_3N_2), barium nitride (Ba_3N_2), metallic calcium and metallic barium, and (iii) hexagonal boron nitride (BN), at a temperature of 800° to 1,300° C. in an atmosphere of an inert gas or ammonia thereby to react the ingredients (i), (ii) and (iii) with each other in a molten state;

cooling the reaction product to be thereby solidified;

mixing the reaction product with a hexagonal boron nitride powder; and then,

maintaining the thus-obtained mixture in a high-temperature and high-pressure region in which boron nitride of the cubic system is thermodynamically stable.

4,551,317

PHOSPHONITRILIC HALIDE POLYMERS

Hsueh M. Li, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 447,720, Dec. 7, 1982, Pat. No. 4,447,408, which is a continuation-in-part of Ser. No. 314,522, Oct. 26, 1981, Pat. No. 4,374,815. This application Apr. 28, 1983, Ser. No. 489,414
Int. Cl.[4] C01B *25/10*
U.S. Cl. 423—300 **37 Claims**

1. A process for producing halophosphazene polymer which comprises (i) heating a nitrogen source with a stoichiometric excess of a phosphorous source so that hydrogen halide is evolved and halophosphazene is formed, said helophosphazene having the formula

$$[X—(PX_2{=}N)_n—PX_3]^+PX_6^-$$

wherein n is a numeral which averages at least 3 and X is halogen, and (ii) heating at least a portion of the halophosphazene with at least a stoichiometric amount of nitrogen source so that hydrogen halide is evolved and substantially linear halophosphazene phazene polymer of higher molecular weight is formed.

4,551,318
STABILIZED SOLUTIONS OF HYDROXYLAMINE OR ITS SALTS IN WATER OR ALCOHOLS, AND THEIR PREPARATION

Otto-Alfred Grosskinsky; Elmar Frommer; Josef Ritz, all of Ludwigshafen; Erwin Thomas, Freinsheim, and Franz-Josef Weiss, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

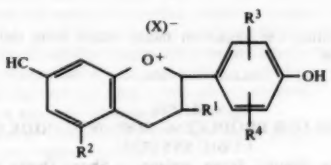
Filed Dec. 24, 1984, Ser. No. 685,257

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347260

Int. Cl.⁴ C01B *21/20*

U.S. Cl. 423—265 **5 Claims**

1. A stabilized solution of hydroxylamine or its salts in water or an alcohol, which contains an anthocyan of the formula



I

where R^1, R^2, R^3 and R^4 are each hydrogen, hydroxyl or C_1–C_4-alkoxy and X is an anion of a strong mineral acid.

4,551,319
TWO-STAGE CONCENTRATION FOR SUPERPHOSPHORIC ACID

Pierre Sanchez, Grand-Couronne, and Pierre Laudat, Franqueville St. Pierre Boos, all of France, assignors to CdF Chimie Azote et Fertilisants, S.A., Paris, France

Filed Aug. 6, 1984, Ser. No. 637,732

Claims priority, application France, Aug. 5, 1983, 8312952

Int. Cl.⁴ C01B *25/16*; B01D *1/00*

U.S. Cl. 423—316 **8 Claims**

1. In a process for the production of superphosphoric acid having a concentration calculated in P_2O_5 of up to 75%, by vacuum evaporation of wet-process phosphoric acid having a concentration calculated as P_2O_5 of between 40 and 54%, comprising in a first stage, concentrating the phosphoric acid in a first evaporator under vacuum until it has a P_2O_5 content of 60 to 66%, and heating in a first heat exchanger under vacuum conditions, said heating being performed by means of a heat-transfer fluid having a temperature of 170° to 200° C., withdrawing a partially concentrated phosphoric acid from said first stage, forming first and second fractions therefrom, and recycling said first fraction into the first evaporator, and in a second stage, passing the second fraction of the phosphoric acid issuing from the first evaporator into a second evaporator, and concentrating said second fraction to a concentration greater than 68%, the heating in a second heat exchanger being performed under vacuum conditions and by means of a heat-transfer fluid at a temperature of 215° to 225° C.,

the improvement which comprises maintaining the pressure in each stage throughout the phosphoric acid side of the heat exchanger equal to or greater than 0.35 bar higher than that in the evaporator vessel in the same stage.

4,551,320
TREATMENT OF CONCENTRATED PHOSPHORIC ACID

Frank J. Dominiani, Jr., Flemington, N.J., and Dennis C. Annarelli, Newtown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 12, 1984, Ser. No. 660,341

Int. Cl.⁴ C01B *25/16*

U.S. Cl. 423—321 R **6 Claims**

1. The method of selectively and substantially reducing the calcium content without affecting substantially the sodium and potassium content of high purity concentrated phosphoric acid which comprises contacting a high purity, undissociated 85% phosphoric acid including calcium, sodium and potassium containing impurities with a strong cation exchange resin and its acid form and recovering 85% phosphoric acid having a reduced calcium content and substantially the same sodium and potassium content as the high purity 85% phosphoric acid being treated.

4,551,321
PREPARATION OF ZEOLITES

Laszlo Marosi, 32 Leuschnerstrasse, 6700 Ludwigshafen; Hans-Ulrich Schlimper, 74 Im Erlich, 6720 Speyer; Matthias Schwarzmann, 54 Carl-Bosch-Strasse, 6703 Limburgerhof, and Joachim Stabenow, 22 Am Feldrain, 6940 Weinheim, all of Fed. Rep. of Germany

Continuation of Ser. No. 268,379, May 29, 1981, Pat. No. 4,404,175. This application Mar. 18, 1983, Ser. No. 476,577

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 3021580

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—329 **2 Claims**

2. A process for obtaining a crystalline ZSM-5 structural type zeolite of the hydrogen cation form directly which comprises reacting at from 100° C. to 200° C. in an aqueous solution under autogenous pressure in the absence of both alkali metal ions and quaternary nitrogen bases and in the presence of one or more amines selected from the group consisting of triethylene tetramine, diethylene triamine, dihexamethylene triamine, dipropylene triamine, and propylene diamine, an aqueous reaction mixture of SiO_2 and $W(OH)_3$, wherein W is an element selected from the group consisting of aluminum, boron, iron or mixtures thereof, said reaction mixture formulated to have a SiO_2/W_2O_3 molar ration of from

$$\frac{96 - \frac{20\,n}{L_R + 4}}{\frac{20\,n}{L_R + 4}} \text{ to } \frac{96 - \frac{20\,n}{L_R + 4}}{\frac{4\,n}{L_R + 4}}$$

which depends on the chain length of carbon atoms L_R in angstrom units and number of amine groups n of the amine employed, an H_2O amine molar ratio of from 0.4 to 100 and an amine/W_2O_3 molar ratio of from 5 to 400, and removing the amine from the zeolite pores by combustion.

4,551,322
PROCESS FOR PREPARING ZEOLITE POWDER OF TYPE A (IV)

Hans Strack, Alzenau; Wolfgang Roebke, Wesseling; Dieter Kneitel, and Ehrfried Parr, both of Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft and Henkel Kommandelgesellschaft auf Aktien, both of Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 358,268, Mar. 15, 1982, abandoned, which is a continuation of Ser. No. 260,764, May 5, 1981, abandoned, which is a division of Ser. No. 846,014, Oct. 27, 1977, Pat. No. 4,303,628. This application Mar. 14, 1983, Ser. No. 474,895

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651419

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—329 **7 Claims**

1. A process of preparing a crystalline zeolite power of Type A with the composition

$$1.0 \pm 0.2 Na_2O : Al_2O_3 : 1.85 \pm 0.5 SiO_2 . yH_2O$$

where y has a value up to 6 with 50 weight % of the particles not over 4.9μ and with a particle spectrum:

Fraction (μ)	Proportion (weight %)
<3	40
<5	90
<10	96
<15	100

comprising hydrothermally crystallizing a SiO_2, Al_2O_3, Na_2O and water containing alkali aluminate, water, alkali silicate synthesis mixture, said process including the steps of having initially present in a tank at 50° C. 300 liters of waterglass containing 7.4% Na_2O and 25.6% SiO_2, feeding in 500 liters of aqueous sodium aluminate containing 90 grams/l of Na_2O and 14 grams/l of Al_2O and having a temperature of 80° C. and adding further aqueous sodium aluminate to this mixture in two steps with 100 liters being added in 25 minutes at 70° C. and then a further 850 liters of the same aqueous sodium aluminate solution being added in 65 minutes at 70° C., the added aqueous sodium aluminate containing 148 grams/l of Na_2O and 103 grams/l of Al_2O_3, then warming the reaction mixture then to 87° C. and crystallizing for 2 hours.

4,551,323

PREPARATION OF ALCOHOLIC HYDROXYLAMINE SOLUTION FROM HYDROXYLAMMONIUM SULFATE

Chempolil T. Mathew, Randolph, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 1, 1982, Ser. No. 437,920

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.⁴ C01B *21/14*

U.S. Cl. 423—387 **16 Claims**

1. A process comprising the steps of:

(a) reacting an alcoholic solution of a base selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, ammonium hydroxide and the corresponding alkoxides of 1–5 carbons with solid hydroxylammonium sulfate, employing an alcohol of 1–3 carbons, a temperature, a pressure and a time sufficient to produce a liquid phase having at least 50% of the hydroxylamine values of the hydroxylammonium sulfate, and

(b) separating the solid phase comprising a sulfate salt corresponding to said base from the liquid phase.

4,551,324

PREPARATION FROM HYDROXYLAMMONIUM SULFATE OF OTHER HYDROXYLAMMONIUM SALTS VIA ALCOHOLIC HYDROXYLAMINE

Chempolil T. Mathew, Randolph, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 437,920, Nov. 1, 1982,. This application Sep. 23, 1983, Ser. No. 534,292

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.⁴ C01B *21/20*

U.S. Cl. 423—387 **30 Claims**

1. A process comprising the steps of:

(a) reacting an alcoholic solution of a base selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, ammonium hydroxide and the corresponding alkoxides of 1–5 carbons with solid hydroxylammonium sulfate, employing an alcohol of 1–3 carbons, a temperature, a pressure and a time sufficient to produce a liquid phase having at least 50% of the hydroxylamine values of the hydroxylammonium sulfate,

(b) separating the solid phase comprising a sulfate salt corresponding to said base from the liquid phase, and

(c) reacting the separated liquid phase with an acid other than sulfuric acid to produce an hydroxylammonium salt other than hydroxylammonium sulfate.

4,551,325

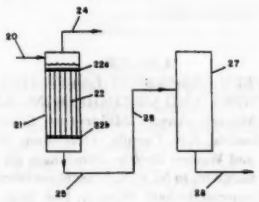
METHOD FOR CONDUCTING A CHEMICAL PROCESS IN A PACKED MULTI-TUBULAR REACTOR

Carlo G. Alesandrini, Jr., and Louie A. Nady, both of Berkeley, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 7, 1983, Ser. No. 549,150

Int. Cl.⁴ C01B *7/01*; C07C *153/01*

U.S. Cl. 423—488 **11 Claims**



1. A method for conducting a liquid phase chemical process in which a feed containing at least one liquid is introduced into a vessel containing a plurality of packed, vertically arranged tubes and in which at least one liquid product and at least one gaseous product are obtained, comprising:

(a) introducing the liquid feed into the vessel at a point above the upper ends of the tubes;

(b) removing a gaseous product from the upper portion of the vessel above the upper ends of the tubes; and

(c) removing a liquid product from the lower portion of the vessel in a controlled manner so as to maintain the level of liquid in the vessel above the upper ends of the tubes substantially throughout the interior of the vessel.

4,551,326

PROCESS FOR PREPARING ALKALI METAL FERRATES

John A. Thompson, 3891 Coco Grove Ave., Miami, Fla. 33133

Continuation of Ser. No. 238,371, Feb. 26, 1981, Pat. No. 4,385,045. This application Feb. 22, 1983, Ser. No. 468,487

Int. Cl.⁴ C01G *49/00*

U.S. Cl. 423—594 **7 Claims**

1. A method for producing alkali metal iron (IV) ferrate, comprising subjecting a particulate reactant mixture of iron oxide and a material selected from the group consisting of alkali metal oxide and alkali metal peroxide, in a respective molar ratio of from about 1:1 to 1:8, to a temperature in the range of from about 400° C. to about 700° C. for a time sufficient to bring about a reaction between said reactants and to form therefrom alkali metal iron (IV) ferrate as a reaction product, the time being in a range extending from less than one minute to a few hours, said reaction being conducted in an atmosphere in which there is an absence of oxygen, and collecting the product.

4,551,327

PROCESS FOR PRODUCING COBALT-AND FERROUS IRON-CONTAINING FERROMAGNETIC IRON OXIDES

Ichiro Honma; Arata Koyama; Masatoshi Amano, all of Moriyama, and Nobusuke Takumi, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaishi, Limited, Osaka, Japan

Filed Jul. 12, 1983, Ser. No. 513,033

Claims priority, application Japan, Jul. 16, 1982, 57-123918

Int. Cl.⁴ C01G *49/06*

U.S. Cl. 423—594 **12 Claims**

1. A process for producing a cobalt- and ferrous iron-containing ferromagnetic iron oxide comprising

(1) dispersing a magnetic iron oxide powder in water,

(2) mixing this dispersion with a suspension prepared by

(a) neutralizing a ferrous salt solution with an alkali to form ferrous hydroxide and then

(b) adding a cobalt salt solution thereto, and

(3) adjusting the excess OH concentration of this mixed slurry to 0.05 to 3 mol/l, thereby coating a ferrous compound and a cobalt compound on the surface of the magnetic iron oxide particles.

4,551,328

SELECTIVELY ABSORBENT LAYER FOR SOLAR COLLECTORS, AND METHOD OF MAKING IT

Edwin Erben, Munich; August Mühlratzer, Gilching; Roland Bertinger, Munich; Boy Cornils, Dinslaken; Bela Tihanyi, Oberhausen, and Werner DeWin, Dinslaken, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,383

Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219996; Mar. 12, 1983, 3308790

Int. Cl.⁴ C23B *5/00*

U.S. Cl. 423—607 **7 Claims**

1. A selectively absorbent layer for solar collectors, consisting essentially of a mixture of chromium oxides formed by the thermal decomposition of chromium hexacarbonyl, or substituted chromium pentacarbonyl from a process gas containing chromium hexacarbonyl, in an inert gas, and oxygen, the process gas including about 0.05 to about 5% chromium hexacarbonyl, by volume, and about 0.01 to about 0.6% oxygen, by volume.

4,551,329

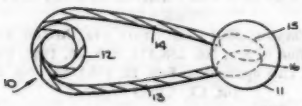
ORAL MEDICAMENT LOLLIPOP

Joan Harris, 2485 Meridian, Miami Beach, Fla. 33140, and Thomas J. Michel, Miami, Fla., assignors to Joan Harris, Miami Beach, Fla.

Filed Jan. 20, 1984, Ser. No. 572,464

Int. Cl.⁴ A01N *25/12*

U.S. Cl. 424—22 **6 Claims**



1. A handle-supported oral mediament in a lollipop format to facilitate chewing or sucking thereof by a patient for therapeutic purposes without, however, exposing the patient to the inadvertent entry of the handle into his throat, said medicament comprising:

A. a lump of the medicament having a mass affording a full single dose of the medicament when fully consumed; and

B. a safety handle having an enlarged end portion embedded in the lump which occupies a large internal region therein to securely anchor said lump and to prevent it from breaking into large pieces when chewed, said handle being formed of resilient stick material having a pair of spring arms whose enlarged end portions are embedded in the lump and are normally held under tension in the lump, said arms springing apart when the lump is detached from either arm in the course of its consumption or as a result of an accidental impact, whereby the handle cannot then be pushed further into the mouth or into the throat of the patient.

4,551,330

SKIN AND HAIR CONDITIONER COMPOSITIONS AND CONDITIONING METHOD

Julius Wagman, and Branko Sajic, both of Chicago, Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,642

Int. Cl.⁴ A61K *7/06, 7/08, 7/42, 7/44*

U.S. Cl. 424—59 **20 Claims**

1. A hair and skin conditioning composition comprising an oil-in-water emulsion including:

(a) about 70 to about 90 weight percent water;

(b) about 5 to about 25 weight percent water-insoluble, unctuous oleaginous material;

(c) as the sole emulsifying agent in the composition, about 0.1 to about 7 weight percent of a water-dispersible emulsifying agent selected from the group consisting of nonionic and cationic emulsifiers, and mixtures thereof; wherein the water-dispersible emulsifying agent does not form a true solution in water;

(d) about 0.05 to about 3.0 weight percent water-dispersible, non-toxic hydrated polyvalent metal salt having a cation selected from the group consisting of aluminum (III), cerium (III), iron (III), zirconium (IV), aluminum zirconium coordination complexes and mixtures thereof; and

(e) sufficient acid or alkali to provide a pH value of about 1.5 to about 7.5;

said emulsion being adapted to invert to a water-in-oil emulsion when rubbed onto skin and hair to provide a moisturizing, conditioning, protective barrier on said skin and hair.

4,551,331

EASILY DISPERSIBLE DIETARY FIBER PRODUCT AND METHOD FOR PRODUCING THE SAME

Richard E. Rudin, Kenosha County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 2, 1983, Ser. No. 500,603

Int. Cl.⁴ A61K *35/78*

U.S. Cl. 424—195.1 **21 Claims**

1. A coated dietary fiber which is readily dispersible in liquids without agglomeration comprising from about 80 to 99.95% by weight of at least one dietary fiber subject to agglomeration upon mixing with liquids, and from about 0.05 to 20% by weight of a food grade emulsifier wherein the emulsifier substantially coats the powder to prevent agglomeration when added to liquids.

4,551,332

VITAMIN E COMPOSITIONS AND METHODS

Theodore Stillman, P.O. Box 63, Hardy, Ark. 72542

Continuation-in-part of Ser. No. 290,157, Aug. 5, 1981, Pat. No. 4,410,517, which is a continuation of Ser. No. 151,627, May 20, 1980, abandoned. This application Oct. 17, 1983, Ser. No. 542,645

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.⁴ A61K *35/78, 31/355, 47/00*

U.S. Cl. 424—195.1 **42 Claims**

1. A dermatological coating material prepared by combining at least 3 parts by weight of a glyceryl stearate with up to 97 parts by weight of vitamin E component to form a solution with the aid of heat, which solution, when cooled, forms a frozen solution at room temperature, wherein said glyceryl stearate is selected from the group consisting of glyceryl monostearate and glyceryl distearate.

4,551,333

METHOD OF PRODUCING FREEZE DRIED FISH EGGS

Michael A. Neri, 48 Flatt Rd., Rochester, N.Y. 14623

Filed May 12, 1983, Ser. No. 493,960
Int. Cl.[4] A23L *1/325;* A23C *1/08*
U.S. Cl. 426—1 4 Claims

1. A method for producing a dry, rehydratable fish egg for use as fishing bait, comprising

procuring a supply of fresh, raw fish eggs from a female fish,

carefully separating said eggs from each other and from the tissue which normally holds them in clusters,

cleaning the separated eggs to rinse away therefrom unwanted residues and salts,

freezing said eggs while maintaining the eggs in spaced, separated relation to each other in a single layer on a substrate having a surface which prevents the eggs from becoming attached by freezing to the substrate, and

subjecting said separated frozen eggs to a sublimation process in a vacuum chamber to remove substantially all moisture therefrom.

4,551,334

DOUGH IMPROVER

Harry Zentner, North Ryde, Australia, assignor to Mauri Brothers & Thomson (Aust.) Pty. Limited, New South Wales, Australia

Filed May 31, 1983, Ser. No. 499,376
Int. Cl.[4] A21D *2/06*
U.S. Cl. 426—26 6 Claims

1. A method for producing bread which comprises:

(a) adding sodium thiosulphate to a yeast-containing dough mixture, said sodium thiosulphate being added as a component of an improver composition, said improver composition being present in an amount of about 0.25% based on the weight of the flour component of the dough;

(b) allowing the mixture to ferment; and

(c) baking the fermented dough.

4,551,335

FERMENTED SUNFLOWER MEAL AND THE METHOD FOR ITS PREPARATION

Marco Canella, Rome; Daniele Marghinotti, Capena; Adriano Bernardi, Monterotondo, and Giancarlo Sodini, Grottaferrata, all of Italy, assignors to E.N.I. Ente Nazionale Incorporated, Rome, Italy

Filed Mar. 31, 1983, Ser. No. 480,835
Claims priority, application Italy, May 27, 1982, 21513 A/82
Int. Cl.[4] A23L *1/36*
U.S. Cl. 426—44 4 Claims

1. A method for preparing fermented sunflower meal, consisting of

activating the heterolactic fermentation of an aqueous suspension of the de-oiled sunflower meal by adjusting its pH to an acid value within the range of 4.0 to 5.5; and

allowing the de-oiled sunflower meal to digest for three days at a temperature between 30° and 40° C. to allow for lactic acid bacteria fermentation with the subsequent removal of chlorogenic acid.

4,551,336

INFUSION BAG

Ying-Cheng Chen, 3rd Fl., No. 29, La. 49, Jen Kung 1st Rd., Hsin Chu City, Taiwan

Filed Dec. 22, 1983, Ser. No. 564,337
Int. Cl.[4] B65B *29/04*
U.S. Cl. 426—83 4 Claims

1. An infusion bag containing infusible substances, comprising a sachet member of liquid-permeable sheets having first and second cones; a transverse seam joining said two cones along a common cone-base circumference, the apexes of said cones being formed at opposite sides of said transverse seam; a longitudinal seam extending from the apex of said first cone to the apex of said second cone; thereby forming a three dimensional hollow internal space wherein said infusible substance is

packed; and a pull string, one end of which is joined near the apex of said first cone.

4,551,337

FRIED PIZZA PRODUCT AND PROCESS FOR PREPARING SAME

Justin M. Schmit, and Eugene H. Luoma, both of Duluth, Minn., assignors to Jeno's, Inc., Casselberry, Fla.

Filed Sep. 30, 1982, Ser. No. 425,023
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—94 8 Claims

1. A process of preparing a pizza, comprising the steps of:

(a) forming a flat, thin dough base for a pizza crust;

(b) removing a plurality of plugs from the dough base to form a pattern of perforations through the dough base where the plugs have been removed;

(c) frying the dough base by immersing it in a fluid medium;

(d) removing the fried crust from said fluid medium; and

(e) applying sufficient sauce to the upper surface of the crust so that a coating of sauce is formed on said upper surface, at least some sauce flows through said perforations onto the lower surface of the crust and pools of sauce form on the upper surface over said perforations.

4,551,338

METHOD FOR CHANGING THE INTERNAL TEMPERATURE OF MEAT BY THE USE OF GAS

Charles H. Wallace, 114 Obrey Dr., Carrollton, Va. 23314

Filed Nov. 22, 1982, Ser. No. 443,285
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—281 2 Claims

1. A method of changing the internal temperature of meat which comprises butchering animals to produce animal carcasses, dressing the carcasses, immediately cutting primal cuts of meat from the animal carcasses at a temperature of 100°–105° F., moving a plurality of needles, each of which has at least one air opening formed therein, into engagement with the meat, with the air openings being contiguous with discrete portions of the meat, supplying air at a pressure of ten to 100 PSI to the needles at a temperature not exceeding approximately 125° F. for a period of time sufficient to raise the internal temperature of the meat to 120° F., removing the needles, heating the meat in a smokehouse to a temperature of about 157° F., moving a plurality of needles, each of which has at least one air opening formed therein, into engagement with the meat, with the air openings being contiguous with discrete portions of the meat, and supplying air at a pressure of ten to 100 PSI to the latter needles at a temperature above approximately 32° F. for a period of time sufficient to chill the meat to a temperature of about 38° F.

4,551,339

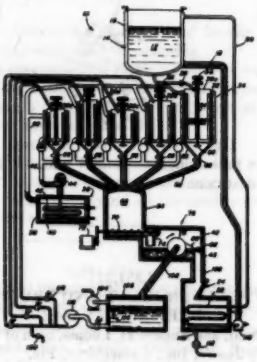
METHOD AND APPARATUS FOR OBTAINING A CONCENTRATED EXTRACT FROM LIQUID SMOKE

Jay Olson, P.O. Drawer C, Crossville, Tenn. 38555

Continuation of Ser. No. 347,907, Feb. 11, 1982, abandoned. This application Mar. 21, 1984, Ser. No. 591,890

Int. Cl.[4] B01D *9/04;* **A23L** *1/221*

U.S. Cl. 426—384 **2 Claims**



1. A method for obtaining a concentrated liquid smoke extract by separating solvent ice crystals from a refrigerated liquid smoke solution containing ice crystals and a liquid smoke solute, said method comprising the steps of:

(a) forming a liquid smoke slush and placing the slush in a tank;

(b) rotating a multiple compartment drum within said tank, said compartments having openings at the outer surface of said drum, said openings sequentially immersed into and withdrawn out of the liquid smoke slush as said drum is rotated, a filter medium covering said openings;

(c) applying suction to each said compartment only when said compartment is immersed in said solution;

(d) capturing the solvent ice crystals on said filter medium by drawing the liquid smoke slush through said filter medium only when said suction is applied to said compartment associated with said filter medium, a concentrated liquid smoke extract flowing into said compartment;

(e) scraping said captured crystals from said filter medium; and

(f) transmitting the concentrated liquid smoke extract in said compartments to said tank for recycling.

4,551,340

PROCESS FOR PREPARING FROZEN PAR-FRIED POTATOES

Nabil A. El-Hag, Lake Peekskill, N.Y.; Stuart A. Cochran, Robinsville, N.J.; Kenneth R. Schwabe, Tuckahoe; Louis Carricato, Yonkers, both of N.Y., and Sudhakar P. Shanbhag, Bourbonnais, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 2, 1980, Ser. No. 212,178

Int. Cl.[4] A23L *1/216*

U.S. Cl. 426—437 **7 Claims**

1. A method of improving the taste, texture, moisture and appearance of frozen potato products wherein the potato products consist of whole raw potato pieces that are to be heated in an oven before consumption which comprises:

(a) soaking the raw potato pieces in an oil bath having a temperature from 120° F. to 250° F. for 30 seconds to 6 minutes,

(b) par-frying said potato products by immersing the oil soaked potato pieces in oil having a temperature from 300° F. to 375° F. for 10 seconds to 120 seconds,

(c) cooling said oil soaked par-fried potato pieces until internal product temperature is below 175° F.,

(d) par-frying said oil soaked par-fried cooled potato products by immersing the potato piece in oil having a temperature from 325° to 400° F. for 10 seconds to 180 seconds, and then

(e) freezing the potato pieces for commercial distribution.

4,551,341

METHOD FOR OBTAINING CLEAR PLANT JUICES AND FOR THE RECOVERY OF VALORIZABLE CONSTITUENTS

Paul Blanie, 282, rue Saint Jacques, 75005 Paris, and Claude Vernier, 15, rue du Louvre, 75001 Paris, Yves Vrignaud, 5, Avenue de Rivoli, 92190, Meudon, all of France

PCT No. PCT/FR81/00098, § 371 Date Apr. 13, 1982, § 102(e) Date Apr. 13, 1982, PCT Pub. No. WO82/00569, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 10, 1981, Ser. No. 373,483

Int. Cl.[4] B01D *13/00*

U.S. Cl. 426—489 **7 Claims**

1. A process for the production of clear juices from plants and for the recovery of a pectic concentrate containing valorizable constituents comprising the steps of

(a) adjusting the temperature of a raw juice, obtained by pressing, as a function of measured pH of the raw juice according to the formula T° C. = −6 pH + 80° C. ± about 3° C.;

(b) subjecting the temperature-adjusted raw juice to ultrafiltration on a membrane to yield a primary clear juice and a primary retained pectic concentrate containing valorizable constituents;

(c) subjecting said primary retained pectic concentrate to a second ultrafiltration on a membrane to yield a second clear juice and a second retained pectic concentrate containing said valorizable constituents;

(d) conducting at least one of the ultrafiltrations on a membrane having a cutoff level of molecular weight on the order of 15,000 to 25,000; and

(e) recovering said second retained pectic concentrate containing said valorizable constituents.

4,551,342

BEVERAGES CONTAINING SPECIFIC CATION-EDIBLE ACID MIXTURES FOR IMPROVED FLAVOR IMPRESSION

Gunther M. Nakel, Aurora, Ind., and David C. Heckert, Oxford, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 462,734, Feb. 1, 1983, abandoned. This application Oct. 21, 1983, Ser. No. 544,310

Int. Cl.[4] A23L *1/236, 2/00, 2/40*

U.S. Cl. 426—548 **32 Claims**

1. A composition for preparing a liquid beverage having a pH of from about 2.5 to about 6.5, which comprises:

(a) a flavor component which contains a flavor selected from the group consisting of fruit flavors, botanical flavors and mixtures thereof in an amount effective to impart flavor characteristics to the prepared liquid beverage;

(b) a cation component defined by the formula:

$$(8.0\times Ca)+(7.1\times Mg)+(7.0\times K)+(3.0-\times Ca\times Mg)+(12.9-\times Ca\times K)+(11.5\times Mg\times K)+(20.3-\times Ca\times Mg\times K)=B,$$

wherein Ca is the weight ratio of calcium in said cation component, Mg is the weight ratio of magnesium in said cation component, and K is the weight ratio of potassium in said cation component, and B is from about 10.0 to about 11.3; and

(c) an edible acid component defined by the formula: $(8.7\times cit)+(8.9\times mal)+(11.4\times phos)+(5.5\times cit\times-mal)-(0.6\times cit\times phos)+(5.0\times mal\times phos)+(30.1-$

×cit×mal×phos)=A, wherein cit is the weight ratio of citric acid in said acid component, mal is the weight ratio of malic, succinic, or a mixture of malic and succinic acid in said acid component, phos is the weight ratio of phosphoric acid in said acid component, and A is from about 9.6 to about 12.1;

(d) said cation and acid components being in amounts effective to impart body to the prepared liquid beverage.

4,551,343

CANINE BISCUIT CONTAINING DISCRETE MEAT AND/OR MEAT BY-PRODUCT PARTICLES AND METHOD FOR MAKING SAME

Gary Gellman, Pomona, N.Y.; George A. Erburt, Morristown, and James E. Roe, Wayne, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 341,969, Jan. 22, 1982, Pat. No. 4,454,163, and a continuation-in-part of Ser. No. 549,352, Nov. 7, 1983,. This application May 29, 1984, Ser. No. 614,601

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[4] A21D *10/00*

U.S. Cl. 426—549 **20 Claims**

1. A method for making dry hard canine biscuits having discrete meat and/or meat by-product particles distributed substantially uniformly throughout the biscuit comprising: p1 (a) dry blending particles containing meat and/or meat by-product as substantial components having a moisture content of less than or equal to about 35 percent by weight with non-fat solids, said meat and/or meat by product particles being present in an amount sufficient to provide particles visible on the surface of said dry canine biscuits, said non-fat solids containing farinaceous material;

(b) admixing about 20 to 30% by weight water with said dry blended mixture to form a first stage dough;

(c) mixing about 0.5 to 10% by weight added fat with said first stage dough to form a final biscuit dough;

(d) forming said final dough into pieces under low shear, non-cooking forming conditions; and

(e) baking and drying said pieces to form dry hard biscuits, wherein the water activity of said particles in step (a) is less than the water activity of a final dough obtained by admixing said non-fat solids, said fat and said water without said particles, and whereby dry, biscuits are produced having discrete visually-apparent meat particles distributed substantially uniformly throughout and embedded in the surface of said dry hard canine biscuits.

4,551,344

METHOD FOR AROMATIZING SOLUBLE COFFEE

George A. Jasovsky, Bayonne; Harold W. Jacquett, and Gaetano J. de Ceglie, both of Palisades Park, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 481,003, Mar. 31, 1983, abandoned. This application Jul. 18, 1984, Ser. No. 632,153

Int. Cl.[4] A23F *5/00*

U.S. Cl. 426—594 **6 Claims**

1. A method for aromatizing soluble coffee comprising the steps of:

(a) condensing, as a frost, grinder gas which has a high carbon dioxide content;

(b) placing the grinder gas frost in a pressure vessel;

(c) supplying heat to the contents of the vessel and allowing the frost to equilibrate at a pressure in excess of 750 psi, thereby forming three phases, a water phase, a liquid carbon dioxide phase, and a gaseous carbon dioxide phase:

(d) draining the water phase from the vessel;

(e) venting quickly the gaseous carbon dioxide phase from the vessel until a pressure of about 300 psi to about 375 psi is reached, then resealing the vessel;

(f) introducing a glyceride into the vessel;

(g) supplying heat to the vessel and pressurizing the vessel;

(h) slowly venting the vessel;

(i) obtaining an aromatized glyceride; and

(j) combining the aromatized glyceride with soluble coffee powder.

4,551,345

PROCESS FOR PREPARING A LIQUID AROMA AND AROMATIZING A DRY COFFEE SUBSTRATE WITH SAME

Reghina Davidescu, Princeton Junction; Gaetano J. de Ceglie, Palisades Park; Harold W. Jacquett, Palisades Park, and Joseph A. Paluzzi, Allentown, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 481,093, Mar. 21, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 651,504

Int. Cl.[4] A23F *5/00*

U.S. Cl. 426—594 **13 Claims**

1. A process for preparing a liquid coffee aroma comprising the steps of:

(a) condensing coffee grinder gas as a frost;

(b) placing the grinder gas frost in a pressure vessel;

(c) supplying heat to the contents of the vessel and allowing the frost to equilibrate at a pressure in excess of 750 psi, thereby forming three phases, a water phase, a liquid carbon dioxide phase, and a gaseous carbon dioxide phase;

(d) draining the water phase from the vessel;

(e) chilling a second vessel to a temperature of less than −80° F.;

(f) venting from below the liquid carbon dioxide surface in the first vessel through a line into the second vessel for a period sufficient to transfer substantially all the liquid carbon dioxide from the first to the second vessel, wherein a solid aroma-rich phase is formed;

(g) isolating the second vessel from the first vessel and warming the second vessel to a temperature of between about −20° F. and 15° F., thereby producing a highly concentrated, effervescent liquid coffee aroma.

4,551,346

METHOD OF PRODUCING AN EDIBLE FAT EMULSION AND FOOD PRODUCT PRODUCED THEREOF

Stanley A. R. Kilroy, Mitcham, Australia, assignor to Alpen Dairy Foods Pty. Limited, Victoria, Australia

PCT No. PCT/AU82/00183, § 371 Date Jun. 30, 1983, § 102(e) Date Jun. 30, 1983, PCT Pub. No. WO83/01728, PCT Pub. Date May 26, 1983

PCT Filed Nov. 11, 1982, Ser. No. 513,968

Claims priority, application Australia, Nov. 11, 1981, PF1515

Int. Cl.[4] A23D *3/00, 3/02*

U.S. Cl. 426—602 **15 Claims**

1. A method of producing a food product containing an edible fat which comprises the steps of

a. preparing a premix comprising casein and/or a casein derivative, an aqueous carrier and an effective amount of peptising agent,

b. agitating and heating the premix to a temperature of at least about 80° C. for a time effective to peptise the casein and/or casein derivative and thereby provide a sol,

c. homogeneously mixing with the sol an edible fat containing casein to obtain a mixture,

d. cooling the mixture to a temperature below 5° C. sufficient to obtain a gel and crystallize the fat within said mixture,

e. stabilizing the mixture by adding further effective amounts of peptising agent thereto and homogeneously mixing and heating the resultant further mixture to a temperature of at least 80° C. to obtain a further mixture in which the added casein molecules have been peptised,

f. cooling the further mixture to a temperature below 5° C. sufficient to obtain a further gel and recrystallize the fat within said further mixture,

g. warming the cooled further mixture to a temperature of about 20° C. to redistribute the fat in said further mixture, and

h. storing the resultant food product at a temperature up to about 5° C.

4,551,347

PROCESS OF PREPARING INSTANT, FLAKED, WHEAT FARINA

Jan Karwowski, Franklin Lakes, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Sep. 14, 1983, Ser. No. 531,983
Int. Cl.⁴ A23L *1/164*
U.S. Cl. 426—621 **26 Claims**

1. Process for preparing a dry, instant, wheat farina or wheat middlings product in flake form which will readily rehydrate with hot water, comprising:

(a) admixing a particulate wheat component selected from the group consisting of wheat farina and wheat middlings, and 0.5 to 3 weight percent of guar gum in powder form, based on the total dry weight of the mixture of the guar gum and the particulate wheat component;

(b) impregnating homogeneous mixture (a) with a sufficient amount of water to saturate mixture (a);

(c) tempering mixture (b) to produce a material at uniform moisture;

(d) cooking tempered material (c) sufficiently at 110° to 120° C. to gel the starch present in the wheat farina or wheat middlings, the average particle size of the mixture (c) being increased thereby;

(e) reducing the average particle size of the cooked material (d), the cooked material (d) being in particulate form;

(f) drying particulate, cooked material (e);

(g) tempering mixture (f) to provide a uniform moisture content throughout mixture (f); and

(h) flaking, tempered, particulate material (g) to form a dry product in flake form,

the dry, flake product being capable of being readily rehydrated to have the texture and flavor characteristics of cooked wheat farina or middlings.

4,551,348

SUGAR INFUSION OF FRUIT

John S. O'Mahony, Amherst; Marvin L. Kahn, Williamsville, and Satya N. Adapa, Derby, all of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Filed Feb. 15, 1983, Ser. No. 466,411
Int. Cl.⁴ A23L *1/09*
U.S. Cl. 426—639 **6 Claims**

1. A process for infusing fruit with sugar solutes comprising:

(a) suspending the fruit in a heated aqueous syrup bath which is circulated at about 35-45 gal./min., said syrup initially incorporating about 65-75 percent dissolved sugar solutes, said sugar solutes being comprised of about 35 to about 100 percent fructose;

(b) inhibiting dilution of the bath caused by exfusing fruit water by introducing a concentrated sugar solution into the bath and withdrawing substantially equal amounts of diluted syrup at a rate of about 2-9 gal./min. so as to stabilize the bath solutes concentration;

(c) concentrating the withdrawn, diluted syrup by evaporation; and

(d) returning the concentrated syrup to the infusion bath.

4,551,349

BIS(PENTAFLUOROSULFUR)DIACETYLENE POLYMER THEREFROM AND PREPARATIONS THEREOF

Thomas A. Kovacena, McConnellsburg, Pa.; Ronald A. DeMarco, Fairfax, and Arthur W. Snow, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,252
Int. Cl.⁴ C23L *11/00*; C08F *12/30, 112/30, 212/18*
U.S. Cl. 427—255.6 **2 Claims**

1. A method of coating poly bis(pentafluorosulfur)diacetylene on a surface which comprises vaporizing bis(pentafluorosulfur)diacetylene to a gas at a temperature from about 55° to about 75° C. and exposing said surface to said gas until sufficient bis(pentafluorosulfur)diacetylene has polymerized on said surface.

4,551,350

TEXTILE FINISHING WITH DURABLE PRESS RESIN COMPOSITION

Eugene R. Martin, Onsted, Mich.; David S. Ansel, Sylvania, Ohio, and Paul A. Manis, Adrian, Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Division of Ser. No. 560,348, Dec. 12, 1983, Pat. No. 4,520,126, which is a continuation-in-part of Ser. No. 430,187, Sep. 30, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,647
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—389.9 **12 Claims**

1. A process for coating textile materials which comprises applying (1) a textile finishing composition consisting essentially of a diluent and a durable press resin composition containing (a) an aminoplast resin and (b) an aldehyde in excess of that present in the aminoplast resin, in which the durable press resin composition is present in an amount of at least 0.18 percent based on the weight of diluent and aminoplast resin and the weight ratio of aldehyde to aminoplast resin is from 0.05 to 0.6, (2) an acid catalyst and (3) a softening agent in an amount of from 0 to 8 parts by weight per 100 parts by weight of finishing composition to a textile material, and thereafter drying the coated material at an elevated temperature.

4,551,351

PROCESS FOR PRODUCING MEAT BLOCK-LIKE PROTEIN MATERIAL

Yoichi Kawasaki, Sennan, and Tsutomu Katayama, Izumisano, both of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Feb. 9, 1984, Ser. No. 578,757
Int. Cl.⁴ A23J *3/00*
U.S. Cl. 426—656 **10 Claims**

1. A process for producing a meat block-like protein material which comprises preparing a slurry containing a raw protein material, heating the slurry under pressure to force the slurry to flow through a flow path, and continuously releasing the flowing slurry from the downstream end of the flow path into a hollow piece connected to the flow path and having an inner surface extending across the releasing direction of the slurry and an outlet opening communicating with the atmosphere provided in the hollow piece thereby forming a fibrous protein material and allowing the fibrous material to accumulate and coagulate on the inner surface to form a block or lump of the fibrous protein material so that it continuously or intermittently discharges from the hollow piece through its outlet opening to give the meat block-like protein material.

4,551,352
METHOD OF MAKING P-TYPE HYDROGENATED AMORPHOUS SILICON

Jacques I. Pankove, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 17, 1985, Ser. No. 692,238
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **6 Claims**

1. A method of forming P-type hydrogenated amorphous silicon comprising the steps of

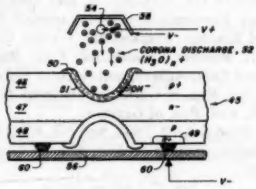
subjecting a substrate to a gaseous mixture of a silicon hydride and an acceptor material with the substrate being heated at a temperature of no greater than about 120° C. so as to deposit a layer of acceptor doped hydrogenated amorphous silicon on the substrate, and then

heating the deposited layer at a temperature greater than 130° C. but less than the temperature at which hydrogen will disassociate from the layer to increase the conductivity of the deposited layer.

4,551,353
METHOD FOR REDUCING LEAKAGE CURRENTS IN SEMICONDUCTOR DEVICES

Philip L. Hower, Concord, and Eric K. Li, Cambridge, both of Mass., assignors to Unitrode Corporation, Lexington, Mass.

Continuation of Ser. No. 335,696, Dec. 30, 1981, abandoned. This application Jul. 24, 1984, Ser. No. 633,675
Int. Cl.[4] H01L *21/326*
U.S. Cl. 427—39 **15 Claims**



1. A method of reducing leakage currents from ions in nonpassivated portions within a multilayer semiconductor device comprising the steps of:

passivating a portion of the surface of said multilayer semiconductor device;

generating a corona discharge at a V+ potential which produces ions which drift from said corona discharge to a V− potential;

placing said multilayer semiconductor device between said V+ and V− potentials to urge the ions to drift to said passivated portion, wherein

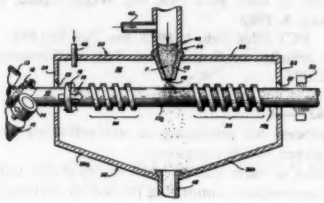
the leakage currents from nonpassivated portions are reduced by neutralizing the ions within said multilayer semiconductor device by said ions resulting from said corona discharge.

4,551,354
METHOD FOR METALIZING METAL BODIES

Darryl Feder, 3134 Maple Leaf Dr., Glenview, Ill. 60025

Division of Ser. No. 374,282, May 3, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,256
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—46 **4 Claims**

1. A method of metalizing an elongated body of metal comprising the steps of pre-heating by induction a portion of the length of the body to a temperature at which metalizing powder will cling and adhere to the pre-heated body's exterior surface; then bathing the exterior of the preheated body portion in a flowing stream of a pre-heated metalizing powder entrained in a fluid carrier of a pre-heated, pressurized, nonoxidizing gas by moving the metal body axially along a path that passes through, and transverse of the direction of flow of, the flowing stream of pre-heated metalizing powder, while simultaneously rotating the metal body about its longitudinal axis, so that particles of the metalizing powder will impinge

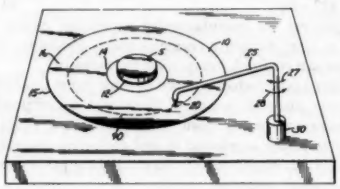


upon and cling to the entire surface of the pre-heated body; and then fusing the clinging, metalizing, powder to the body at a fusing temperature that is higher than the pre-heat temperature of both the body and the metalizing powder.

4,551,355
HIGH SPEED COATING PROCESS FOR MAGNETIC DISKS

Charles P. Ericson, St. Paul, and Bahram Shadzi, Richfield, both of Minn., assignors to Magnegic Peripherals, Minneapolis, Minn.

Continuation of Ser. No. 504,638, Jun. 15, 1983, abandoned. This application Jul. 26, 1984, Ser. No. 614,882
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—48 **8 Claims**



1. In an apparatus having a spindle rotatable by a power source, a disk having an inside diameter and an outside diameter and a central opening, said disk being secured for rotation with said spindle at said central opening, and a nozzle for dispensing magnetic medium material at a nozzle discharge pressure onto said disk, said nozzle being moveably mounted with respect to said disk and being moveable between said outside diameter and said inside diameter, a method for applying a magnetic medium to said disk, comprising the steps of:

rotating said disk at a rotational speed of at least 3000 rpm;

during said disk rotating step, applying said magnetic medium material to said disk from said nozzle at a nozzle discharge pressure of about 6–8 psig. as said nozzle moves at a rate of travel between 1.0 and 1.5 inch/second from said outside diameter to said inside diameter and returns;

reducing the rotational speed of said disk almost immediately following said medium material applying step to a speed suitable for magnetic orienting the medium; and

exposing said disk to a medium-orienting magnetic field during said period of reduced rotational speed.

4,551,356

PROCESS FOR PRODUCING AN ANTIREFLECTING LAYER ON VIEWING SCREENS

Hans Heiz, Dagmersellen, Switzerland, assignor to Therese Heiz, Dagmersellen, Switzerland

PCT No. PCT/EP83/00026, § 371 Date Oct. 3, 1983, § 102(e) Date Oct. 3, 1983, PCT Pub. No. WO83/02682, PCT Pub. Date Aug. 4, 1983

PCT Filed Feb. 1, 1983, Ser. No. 540,561

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1982, 3203291

Int. Cl.⁴ B05D *5/06, 5/12*

U.S. Cl. 427—64 9 Claims

1. A process for producing an anti-reflecting layer on a viewing screen which comprises:

(a) coating an outer face of said viewing screen with a layer of a composition comprising linseed oil varnish, and then processing said layer, while still wet, with a composition comprising an alkali metal silicate or a silicic acid, which is capable of reacting with said varnish composition; or

(b) coating an outer face of said viewing screen with a layer of a mixture of the composition comprising linseed oil varnish and the composition comprising an alkali metal silicate or silicic acid.

7. The process as claimed in claim 1, wherein said alkali metal silicate or silicic acid is compounded with fluorescent or coloring substances or a mixture thereof for optically matching the anti-reflecting layer to the viewing screen.

4,551,357

PROCESS OF MANUFACTURING CERAMIC CIRCUIT BOARD

Yukihisa Takeuchi, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Oct. 16, 1984, Ser. No. 661,470

Claims priority, application Japan, May 25, 1984, 59-107083

Int. Cl.⁴ B05D *5/12, 3/02*

U.S. Cl. 427—96 30 Claims

1. A process for manufacturing a ceramic circuit board, wherein at least dielectric ceramics and a conductor paste of base metal are co-fired, comprising the steps of:

preparing said conductor paste of base metal containing an organic material which is thermally decomposed at a temperature higher than a decomposition point of an organic binder contained in said dielectric ceramics;

forming a circuit pattern of said conductor paste containing said organic material;

thermally decomposing said organic binder in an oxidizing atmosphere at a temperature lower than said decomposition point of said organic material; and

thermally decomposing said organic material in an atmosphere having a partial oxygen pressure lower than that of said oxidizing atmosphere.

16. A process of manufacturing a ceramic circuit board, werein at least dielectric ceramics and a conductor paste of base metal are co-fired, comprising the steps of:

forming a circuit pattern of said conductor paste of base metal;

covering the formed circuit pattern with an organic material which is thermally decomposed at a temperature higher than a decomposition point of an organic binder contained in said dielectric ceramics;

thermally decomposing said organic binder in an oxidizing atmosphere at a temperature lower than said decomposition point of said organic material; and

thermally decomposing said organic material in an atmosphere having a partial oxygen pressure lower than that of said oxidizing atmosphere.

4,551,358

ELECTRODE PREPARATION

Edward S. Lane, Didcot, and Michael R. H. Hill, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, England

Continuation of Ser. No. 450,130, Dec. 15, 1982, abandoned.

This application Jun. 11, 1984, Ser. No. 619,323

Claims priority, application United Kingdom, Dec. 18, 1981, 8138252

Int. Cl.⁴ H01M *4/28*

U.S. Cl. 427—126.6 4 Claims

1. A method of making a nickel oxide electrode which comprises

(i) impregnating a porous nickel substrate for an electrode with a solution of a nickel compound in a non-aqueous liquid medium, said nickel compound being convertible to nickel hydroxide gel in step (ii);

(ii) contacting the impregnated substrate with an epoxy compound thereby to convert the nickel compound in situ to nickel hydroxide gel; and

(iii) removing reaction product(s) to provide the final electrode.

4,551,359

PRODUCTION OF MAGNETIC RECORDING MEDIA

August Lehner, Roedersheim-Gronau; Joachim Hack, Ludwigshafen; Karl Krucker, Frankenthal; Werner Balz, Limburgerhof; Karl H. Roemer, Frankenthal; Peter Rudolf, Fussgoenheim; Roland Falk, Achern, and Guenter Eckert, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,181

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325555

Int. Cl.⁴ H01F *10/02*

U.S. Cl. 427—130 2 Claims

1. In a process for the production of a magnetic recording medium having a thin magnetic layer by dispersing finely divided, magnetically anisotropic material and conventional additives in a solution of a polymeric binder in an organic solvent, applying a layer of the dispersion to a non-magnetizable base by means of a knife-coater, and drying the applied layer, the improvement which comprises: adding to the dispersion to be applied to the base from 3 to 30% by weight, based on the amount of polymeric binder, of a high molecular weight organic compound based on a cellulose reaction product having a K value of more than 75, whereby the dispersion has a viscosity of from 50 to 400 mPa.s measured at 23° C. and an oxide/solvent ratio of from 1:4.5 to 1:10.

4,551,360

METHOD OF OFFSET PRINTING ON POLYPROPYLENE RESIN CASES FOR VIDEO TAPE CASSETTES

Masayuki Kawajiri, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,900

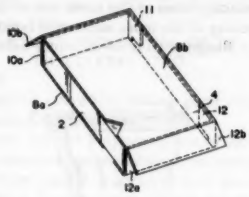
Claims priority, application Japan, Nov. 10, 1983, 58-211372

Int. Cl.⁴ B05D *1/36, 5/04, 7/04*

U.S. Cl. 427—160 7 Claims

1. A method of offset printing on a polypropylene resin case for a video tape cassette, which comprises the steps of first

applying an anchor coat onto the surface to be thus printed of a polypropylene sheet to be folded into said case, and then



carrying out offset printing on the anchor coat surface by using an offset printing ink of ultraviolet ray-curing type.

4,551,361

TINTABLE SCRATCH RESISTANT COATING

Alfred J. Burzynski, and James J. Tillman, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 15, 1984, Ser. No. 671,535

Int. Cl.[4] B32B *3/00*

U.S. Cl. 427—164 **18 Claims**

1. A composition for providing a scratch resistant, tintable cured coating for a substrate, the composition comprising

(A) a further curable, solvent soluble organopolysiloxane that is a hydrolysis reaction product of methacryloxypropyltrimethoxy silane and water;

(B) phenylphosphonic acid as an additive to part (A) before coating the substrate or used in the hydrolysis as a starting ingredient; and

(C) an organic solvent for (A) and (B), the solution being adapted for coating and curing to form a scratch resistant azo dye tintable cured coating.

10. A method of producing a scratch resistant, cured, tintable coating on a transparent substrate without reducing the tinting absorbency at the expense of greater adhesion and scratch resistance, the method comprising the steps of:

(A) hydrolyzing methacryloxypropyltrimethoxy silane and vinyl triethoxy silane with 1 to 7 moles of water and phenylphosphonic acid to provide a solvent soluble, further curable organopolysiloxane;

(B) dissolving the organopolysiloxane of step (A) in an organic solvent;

(C) adding phenylphosphonic acid to the solution of (B) and dissolving the same;

(D) coating a transparent substrate with the solution of (C);

(E) heating the coating to cure the organopolysiloxane and provide a tintable, cured, scratch resistant coating.

4,551,362

METHOD OF TREATING UNVULCANIZED ELASTOMERIC OBJECTS

Engelbert G. Harms; Axel W. Schmeitz, both of Aachen, and Hubertus P. Thomaschewski, Alsdorf, all of Fed. Rep. of Germany, assignors to Uniroyal Englebert Reifen GmbH, Aachen, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 643,659

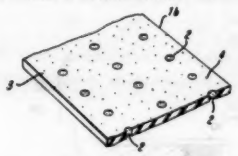
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330505; Aug. 24, 1983, 8324313[U]

Int. Cl.[4] B05D *1/16*

U.S. Cl. 427—180 **5 Claims**

1. A method of treating at least a surface of an unvulcanized and therefore tacky elastomeric molded object or semi-finished product for use in further manufacturing, said method including the step of neutralizing said thickness with powdery or dust-like separating material thereby avoiding problems with regard to product surface sticking venting, molding and removal from the molds during further manufacturing of semi-finished products;

the improvement therewith comprising the steps of using a separating material which is in the form of an unvulcanized powdery rubber employed as dry and non-adhesive fine



particles, and applying said powdery rubber at least to said surface which is to be treated.

4,551,363

ELECTRO LUMINESCENCE VISUAL DEVICE

Brian Fenech, 3 Schernott Pl., Bellmore, N.Y. 11710

Filed May 2, 1984, Ser. No. 606,282

Int. Cl.[4] A44C *25/00*

U.S. Cl. 428—28 **11 Claims**

1. An electroluminescence visual device, comprising, in combination liquid mercury and a sealed glass enclosure, said mercury only partially filling said enclosure so as to be free to move therein, said glass enclosure having at least a portion thereof unobstructed in the vicinity of the location of the mercury, whereby when said mercury moves in said enclosure, light is emitted arising from ionization and excitation throughout the entire volume of said enclosure, said light being visible therethrough at least in said unobstructed portion of the enclosure, and further comprising a sealed enclosure with a conducting region on a portion thereof for preventing the buildup or redistribution of electrical charges, wherein said mercury may move against said conducting surface region yet not emit light but will emit light on the other portions of the sealed enclosure.

4,551,364

CORNER MEMBER FOR A SPACER STRIP FOR A SEALED WINDOW UNIT

Lawrence W. Davies, Winnipeg, Canada, assignor to Omniglass Ltd., Winnipeg, Canada

Filed Jul. 12, 1984, Ser. No. 630,275

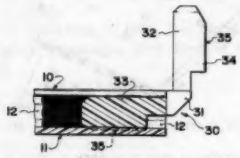
Claims priority, application United Kingdom, Jul. 15, 1983, 8319264

Int. Cl.[4] E06B *3/24;* **E04B** *1/66*

U.S. Cl. 428—34 **13 Claims**

1. A combination of a corner member and spacer strips for use in the manufacture of a sealed window unit comprising a plurality of spacer strips each comprising a hollow elongate body of substantially rectangular cross-section providing two side surfaces for contacting and spacing adjacent surfaces of glass panes, an outer surface for facing outwardly of the outer edge of the glass panes and an inner surface for facing inwardly toward opposed spacer strips of the sealed window unit, the inner surface having a slot extending along the full length thereof, the corner member comprising a pair of legs arranged

right angles, each of the legs being dimensioned so as to be received within the hollow body of one of the spacer strips in a compression fit, the leg and spacer strip being shaped and arranged such that the compression fit is limited to areas of the



spacer strip adjacent junctions thereof between the side surfaces and the outer surface whereby the compression fit does not cause opening of the spacer strip at the slot in the inner surface.

4,551,365

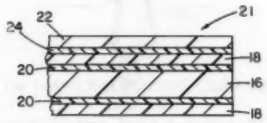
RIGID COEXTRUDED SHEET AND CONTAINER

Laszlo J. Bonis, Swampscott, Mass., assignor to Composite Container Corporation, Medford, Mass.

Filed Oct. 23, 1981, Ser. No. 314,115

Int. Cl.[4] B65D *89/00, 1/02;* **B32B** *27/28*

U.S. Cl. 428—35 **8 Claims**



1. A coextruded thermoplastic sheet suitable for thermoforming into a rigid container, said sheet comprising

a bulk layer made of a first nonfoamed material,

a pair of bending moment resisting layers adhered to opposite surfaces of said bulk layer and made of a second material that is more rigid than said first material,

said second material being acrylonitrile-methyl acrylate copolymer, said moment resisting layers being adhered to said bulk layer by adhesive tie layers coextruded with said bulk layer and said moment resisting layers,

whereby said bulk layer acts to locate said second material of more rigidity at a location spaced from the neutral axis of said sheet where it efficiently resists bending moments and provides rigidity to said sheet.

4,551,366

COMPOSITE VESSEL EXCELLENT IN PRESERVABILITY AND PROCESS FOR PREPARATION THEREOF

Yoshitsugu Maruhashi, Yokohama, and Sadao Hirata, Kamakura, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

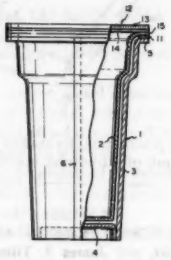
Filed Dec. 30, 1982, Ser. No. 454,612

Claims priority, application Japan, Jan. 11, 1982, 57-1252[U]; Mar. 10, 1982, 57-36512

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—35 **17 Claims**

1. A function-separated composite vessel excellent in the easy openability, preservability and resistance to the deformation due to reduction of the pressure, which comprises (1) a cup-shaped outer member composed of a paper substrate and having a barrel portion, a bottom portion bonded to the lower end of the barrel portion and a curl or flange portion formed on an upper end opening of the barrel portion, said bottom portion being formed of a paper sheet having an air permeability, and (2) a flexible seamless cup-shaped inner member composed of a gas-barrier plastic material, said inner member being formed by plug-assist-forming a film of the gas-barrier plastic material within the outer member as a female mold until the film is substantially exactly fitted in the inner side of the outer member and an opening of the inner member is bonded only to the curl portion or flange portion of the outer member, whereby



when the vessel is hot-filled, the opening of the vessel sealed and the filled contents allowed to cool, deformation of the configuration of the cup-shaped outer member caused by reduction of the inner pressure in the sealed vessel due to decrease of the volume of the content and condensation of vapors is substantially avoided.

4,551,367

PACKAGED PHOTOGRAPHIC PRODUCT

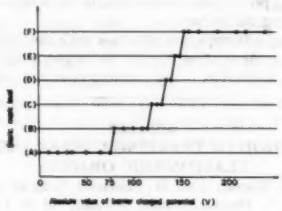
Toshio Nagatani; Norio Chiba; Takao Hatanaka, and Toshio Saito, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 273,924, Jun. 15, 1981, abandoned. This application May 2, 1984, Ser. No. 606,343

Claims priority, application Japan, Jun. 23, 1980, 83910

Int. Cl.[4] B65D *65/40*

U.S. Cl. 428—35 **7 Claims**



1. A packaged photographic product, comprising a composite having a light-sensitive photographic material interposed between protective materials, which composite is further packaged within a barrier packaging material, said barrier packaging material having at least a metal layer provided internally and at least one layer of a polyolefin or a polyolefin derivative prepared by extrusion lamination, and said product also satisfying at least one of the conditions (a) and (b) shown below:

condition (a): the surface potential of said barrier packaging material on the side of said protective material having an absolute value of not higher than 25 V;

condition (b): the surface specific resistance of said protective material being not higher than $1\times10^{11}\Omega$ under the condition of the relative humidity of 60%.

4,551,368
POLYESTER MELT BLENDS HAVING HIGH GAS BARRIER PROPERTIES

Richard R. Smith, Cuyahoga Falls, and John R. Wilson, Hartville, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 7, 1982, Ser. No. 415,211
Int. Cl.[4] C08L *67/02*
U.S. Cl. 428—35 **17 Claims**

1. A melt blend of polyesters having good oxygen barrier resistance, consisting essentially of:

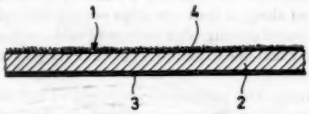
the melt product of two polyesters, one of said polyesters being polyethylene isophthalate homopolymer in an amount of from about 5 to about 95 mole percent and the remaining 95 to 5 mole percent being polyethylene terephthalate homopolymer, said mole percent based upon the total moles of said polyesters, the melt blend having an oxygen permeability of 8 cc·mil/100 in^2·day·atm or less and an intrinsic viscosity of 0.4 dl/g or greater.

7. A melt blend of polyesters according to claim **1**, **2**, **4**, **5**, or 6, wherein said polyester blend is in the form of a container.

4,551,369
COMPOSITE PACKAGING MATERIAL AND PROCESS FOR MAKING SAME

Roland K. Belz, Sonnenhalde 31, D-7022 Leinfelden-Echterdingen-1, Fed. Rep. of Germany

Continuation of Ser. No. 221,288, Dec. 30, 1980, Pat. No. 4,469,728. This application Aug. 30, 1984, Ser. No. 645,508
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1980, 3000516
Int. Cl.[4] A47K *13/14*
U.S. Cl. 428—36 **32 Claims**



1. In a packaging material having at least one outer, normally water-insoluble sealing layer and at least one soluble layer connected to said water insoluble layer, said soluble layer containing a solubilizer for said water-insoluble sealing layer, the improvement wherein:

said water-insoluble sealing layer comprises an extruded non-porous layer of a thermoplastic material which is soluble in a non-neutral medium;

said soluble layer comprises an extruded layer of a thermoplastic material; and,

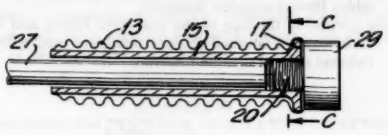
said solubilizer is present in an amount sufficient for solubilizing said water insoluble layer and said water soluble layer when the latter is also formed by extrusion of a water insoluble thermoplastic material.

4,551,370
SHIRRED CASING STICK ARTICLE WITH END CLOSURE AND METHOD FOR MAKING THE SAME

Joseph A. Nausedas, Oak Forest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1983, Ser. No. 481,032
Int. Cl.[4] A22C *13/00*
U.S. Cl. 428—36 **4 Claims**

1. A hollow shirred stick tubular casing article having compressed casing pleats disposed about and along a cylindrical bore, with an end portion of said casing length extended forward from said pleats and over a fore end of said bore and formed into an end closure inside said bore; said end closure being a compacted, substantially axially symmetrical body of casing composed of at least one single-ply tubular layer of the casing of said end portion invaginated symmetrically into said



bore and collapsed axially upon itself inside said bore between an end of a said layer and the end of said casing end portion.

4,551,371
MULTIPLE LAYER FLEXIBLE SHEET STRUCTURE

John P. Eckstein, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 306,675, Sep. 29, 1981, Pat. No. 4,418,841. This application Nov. 4, 1983, Ser. No. 535,935
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.[4] B65D *35/08*; B32B *15/08, 27/08*
U.S. Cl. 428—36 **20 Claims**

2. A multiple layer sheet structure, wherein the layers are firmly adhered to each other to make a unitary structure, the layers comprising, in order:

(a) a layer of LLDPE;
(b) a first adhesive layer;
(c) a metal foil layer;
(d) a second adhesive layer; and
(e) a polyethylene layer.

4,551,372
LAMINATED SAFETY GLASS

Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Mar. 23, 1984, Ser. No. 592,895
Claims priority, application France, Mar. 31, 1983, 83 05326; Mar. 31, 1983, 83 05328
Int. Cl.[4] B32B *23/02*
U.S. Cl. 428—38 **8 Claims**

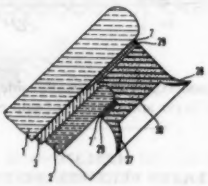
1. A safety glass suitable for mounting in an opening, comprising:

a first glass sheet having a peripheral edge,

a second glass sheet having a peripheral edge and a width and length smaller than that of said first glass sheet, said

first and second glass sheets being glued together by a plastic insert therebetween in such fashion that said second glass sheet falls entirely within the periphery of said first glass sheet so that corresponding portions of said edges form a stairstep structure,

the portion of the side of the first sheet facing said second sheet but not covered thereby being covered with a peripheral strip of opaque material,



the opaque material being covered with an adhesive bead extending from the peripheral edge of said second glass sheet to that of said first glass sheet, said bead forming a water tight seal about the plastic insert, and having a thickness greater than that of the peripheral edge of said second sheet so as to serve as a fastener for mounting said safety glass in said opening.

4,551,373

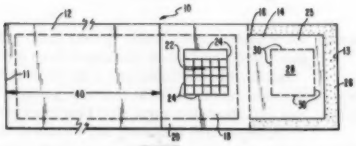
LABEL CONSTRUCTION

Thomas J. Conlon, 90 Broadway, Massapequa Park, N.Y. 11762

Filed Nov. 4, 1983, Ser. No. 548,788

Int. Cl.[4] G09F *3/00*

U.S. Cl. 428—43 **4 Claims**



1. An improved label construction for a retail product comprising

a base label segment including

a main body portion securable to said product, and

an end portion foldably disposable into overlying coplanar relationship with a portion of the upper surface of said main body portion

said end portion having

a first surface adapted to be disposed in interfacial overlying abutting relation with the portion of the upper surface of said body portion disposed therebeneath when disposed in folded-over condition, and

a second surface adapted to form a coplanar continuation of the upper surface of said body portion when said end portion is disposed in folded condition thereover,

said foldable end portion serving to define, when folded into overlying coplanar relation with said main body portion, an ever exposed upper surface on said main body portion and an adjacent concealable upper surface on said main body portion disposed therebeneath,

means disposed at least adjacent a portion of the perimetric edge of the first surface of said end portion to secure the end portion in overlying relation with the concealable upper surface of said main body portion when folded thereover,

product identification indicia complementally disposed on the ever exposed surface of said main body portion and on the second surface of said foldable end portion to compositely present the same in continuous unbroken relation when said end portion is folded over said main body portion; and

means for facilitating removal of at least a portion of said end portion from overlying relationship with said concealable upper surface of said body portion to expose the surface of the main body portion therebeneath.

4,551,374

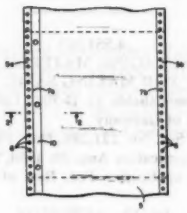
CONTINUOUS SHEET WITH PERFORATED TEAR-OFF DRIVING EDGE AND RECESSED REINFORCED INNER EDGE

Thomas A. Holmberg, Richfield, Minn., assignor to The Holmberg Company, Minneapolis, Minn.

Filed Jun. 20, 1984, Ser. No. 622,756

Int. Cl.[4] B32B *3/08*

U.S. Cl. 428—43 **2 Claims**



1. A continuous sheet having a plurality of drive perforations formed along at least one edge portion thereof,

the perforated driving edge portion of said continuous sheet having a tear line to permit removal of the perforated edge portion,

a reinforcing strip permanently adhered to said sheet along the tear line on the opposite side of the tear line from the perforated driving edge portion, said strip being recessed into the edge portion of the sheet so that the thickness of said sheet reinforced by said strip is no greater than the full thickness of the remaining portion of the sheet to produce substantially uniform sheet thickness across the entire width of the continuous sheet before and after removal of the perforated edge portion.

4,551,375

GLASS CLOTH WITH THIN REINFORCED JOINTS

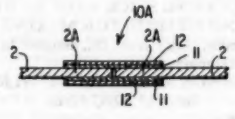
Masanori Sato, and Kazuo Iizima, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Japan

Filed Sep. 14, 1984, Ser. No. 650,531

Claims priority, application Japan, Sep. 22, 1983, 58-146051[U]

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—57 **9 Claims**



1. In a continuous glass cloth for use in the formation of pre-pregs by impregnating said continuous glass cloth with a thermosetting resin varnish and heating the soimpregnated continuous glass cloth to dry the varnish comprising a plurality of glass cloth pieces of predetermined thickness, having edges

and end portions associated with and adjacent respective edges, which are joined together, the improvement comprising:

joints connecting adjacent glass cloth pieces together at respective adjacent edges thereof, each said joint having a total thickness less than about 1.5 times the thickness of said glass cloth, said joints comprising:

end portions of respective adjacent glass cloth pieces, said end portions being disposed in a subtantially coplanar relationship with one another and having respective associated edges thereof in substantially abutting relationship with each other;

at least one joining member overlapping said end portions of said adjacent glass cloth pieces, said joining member inert to and insoluble in said thermosetting resin varnish during pre-preg formation and being capable of withstanding the drying temperature of said varnish without substantial loss of bending, tensile and impact strength; and

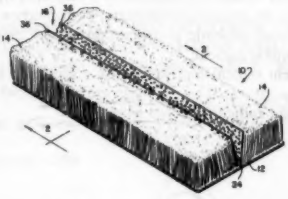
a thermoplastic resin located between said at least one joining member and said end portions of said adjacent glass cloth pieces, said thermoplastic resin bonding said at least one joining member to said end portions, said thermoplastic resin being inert to and insoluble in said thermosetting resin varnish during pre-preg formation and capable of withstanding the drying temperature of said varnish without substantial loss of bonding strength.

4,551,376

LUBRICATED FIN PILE-TYPE WEATHERSTRIP

Milton Kessler, 302 McClurg Rd., Youngstown, Ohio 44501

Filed May 7, 1985, Ser. No. 731,376
Int. Cl.⁴ D04H *11/00;* **E06B** *7/22*
U.S. Cl. 428—85 **20 Claims**



1. A weatherstrip of the fin, pile-type, comprising:

a base strip;

a longitudinally extending row of pile attached to said base strip;

a barrier fin of generally U or V shaped configuration secured in an upright orientation along said base strip adjacent said row of pile, with legs of said barrier fin defining therebetween an elongated reservoir; and

a lubricating grease within the reservoir defined by the legs of said barrier strip, said lubricating grease having a viscosity sufficiently high so that it is squeezed out of the reservoir only with some difficulty, and having a liquification temperature sufficiently high so that it does not liquify under conditions of normal usage.

4,551,377

ABSORBENT PADS

John Elves, Magor, Wales, and Stephen J. Ley, Nr. Lydney, England, assignors to Chicopee, New Brunswick, N.J.

Filed May 9, 1983, Ser. No. 492,917
Claims priority, application United Kingdom, Jun. 10, 1982, 8216937
Int. Cl.⁴ B32B *5/28;* **B65D** *81/26;* **D04H** *1/48, 1/66*
U.S. Cl. 428—137 **22 Claims**

1. An absorbent pad of non-woven fabric comprising absorbent textile fibers, said fabric having high absorbency and integrity, the pad having on one side a layer of binder material for providing a surface having an absorbency reduced with respect to the remainder of the pad, the remainder of the pad being free of binder, said fabric having apertures formed therein for allowing fluid to pass through the binder layer.

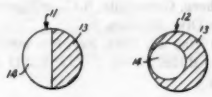
17. A method of manufacturing an absorbent pad as claimed in claim 1 comprising the steps of entangling a web of absorbent textile fibres, forming apertures therein, and applying a layer of binder material to the web.

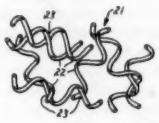
4,551,378

NONWOVEN THERMAL INSULATING STRETCH FABRIC AND METHOD FOR PRODUCING SAME

Patrick H. Carey, Jr., Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 11, 1984, Ser. No. 629,770
Int. Cl.⁴ D04H *1/06, 1/54*
U.S. Cl. 428—198 **18 Claims**





1. A substantially uniform stretch fabric comprising a nonwoven web of bicomponent fibers bonded together by fusion of fibers at points of contact and thermally crimped in situ in the web.

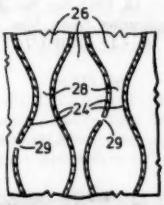
14. The fabric of claim 1 wherein said fabric is repeatedly stretchable to an amount at least 50% above the original fabric length.

4,551,379

INFLATABLE PACKAGING MATERIAL

Stanley R. Kerr, Apt. 2201, 355 St. Clair Ave. W., Toronto, Ontario, Canada (M5P 1N5)

Filed Aug. 31, 1983, Ser. No. 528,004
Int. Cl.⁴ B32B *3/12;* **B65D** *81/02*
U.S. Cl. 428—200 **20 Claims**



1. A packaging material formed from a pair of juxtaposed sheets, said material including a plurality of continuous passages formed between said sheets and extending between two edges thereof, said passages being inflatable by admission of air and sealing of each passageway to provide a shock absorbing facility, adjacent passages being separated by partitions extending between said edges and having a substantially uniform thickness at least one partition of each passage following a sinuous path between said edges, each of said one partitions

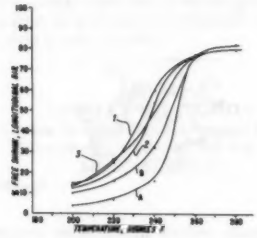
having a line of symmetry that extends across portions of adjacent ones of said passages whereby an object supported on a marginal portion of one passage adjacent said one partition will also be supported on a marginal portion of an adjacent passage and the spacing between the partitions delimiting each passage varying between the two edges of said sheet to provide a plurality of reductions in the cross sectional area of said passage spaced apart along the passage whereby air displaced from one end of said passage to the other is subjected to successive restrictions to the flow of air.

4,551,380

ORIENTED HEAT-SEALABLE MULTILAYER PACKAGING FILM

Julian H. Schoenberg, Greenville, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed May 10, 1984, Ser. No. 609,046
Int. Cl.[4] B32B *27/08, 27/32;* B29D *23/04*
U.S. Cl. 428—218 **20 Claims**



1. An oriented heat sealable multilayer film comprising:
a cross-linked core layer consisting essentially of a linear low density polyethylene; and
two cross-linked surface layers each comprising a three component blend of (1) a linear low density polyethylene, (2) a linear medium density polyethylene and (3) an ethylene vinyl acetate copolymer.

4,551,381

COATING FILM HAVING ADHESIVENESS

Tetsuhiko Inoue, 2-37-8 Mukogaoka, Bunkyo-ku, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,340
Claims priority, application Japan, Mar. 29, 1982, 57-48847
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—240 **9 Claims**

1. A composite sheet comprising a flexible thin fabric substrate, a first flexible continuous layer of a cured liquid coating material formed on one side of said fabric substrate and partially impregnated in said fabric substrate, a second flexible continuous layer of a cured resinous powder coating material formed on the first flexible layer, and an adhesive layer formed on the other side of said fabric substrate.

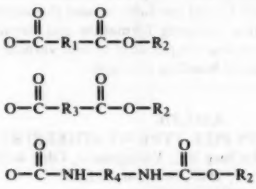
4,551,382

SIZING COMPOSITION AND METHOD OF MAKING SAME AND USE THEREOF FOR SIZING TEXTILE YARNS

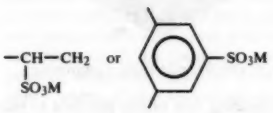
Pierre Gagne, Tassin La Demi Lune; Yvette Girardeau, Fontaines-sur-Saone, and Bernard Pointud, Dardilly, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Division of Ser. No. 582,483, Feb. 22, 1984,. This application Jan. 25, 1985, Ser. No. 694,795
Claims priority, application France, Feb. 23, 1983, 83 02917
Int. Cl.[4] D06M *15/52*
U.S. Cl. 428—258 **31 Claims**

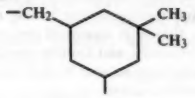
1. A process for sizing warps of textile yarns with a sizing composition comprising in aqueous solution
(a) an anionic polyester-urethane of molecular weight between 10,000 and 100,000 having a plurality of polyester blocks therein derived from at least one chain formation of units of the formulas (I) and (II), said blocks being joined together by groups of the formula (III)



wherein;
R_1 is a divalent radical represented by a saturated hydrocarbon radical, an unsaturated aliphatic hydrocarbon radical, an unsaturated aliphatic hydrocarbon radical or a monocyclic aromatic radical;
R_2 is a divalent radical represented by a saturated aliphatic radical or a saturated cyclic hydrocarbon radical;
R_3 is a divalent radical selected from



M being an alkali metal;
R_4 is a divalent radical selected from the group consisting of hexamethylene, tetramethylhexamethylene,



m-phenylene, p-phenylene, 2,4-tolylene, 2,6-tolylene, dicyclohexylmethane-4,4'-diyl, diphenylmethane-4,4'-diyl and naphthalane-1,5-diyl; and
(b) a polymer derived from
(i) an acrylic monomer of the formula:

wherein X is a hydrogen atom or methyl radical and Y is one of the following groups:

—COOH

—COOZ

(Z being an alkyl radical containing 1 to 8 carbon atoms)

$$-C{\equiv}N$$

or

$$-\overset{\overset{O}{\|}}{C}-NH_2,$$

and/or

(ii) a vinyl monomer corresponding to the formula:

$$CH_2{=}CH{-}OOCR \qquad (V)$$

in which R is a hydrocarbon radical having from 1 to 20 carbon atoms,

wherein said composition comprises from about 40 to about 90 weight percent of a polyester-urethane and 10 to 60 weight percent of said polymer of (b); said process comprising immersing the yarn in an aqueous bath containing said sizing composition at a predetermined concentration and temperature, and dewatering said yarns by passing said yarns between rollers.

7. Textile yarns sized according to the process of claim 1.

10. Woven fabrics derived from the yarns according to claim 7.

4,551,383

PROCESS FOR THE PRODUCTION OF PADDING FOR CLOTHING OR FURNISHINGS AND PRODUCT

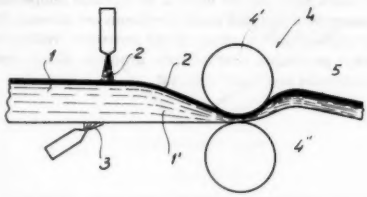
Luciano Siniscalchi, Via Milano, 53, 22059 - Robbiate (Como), Italy

Filed Dec. 27, 1984, Ser. No. 686,833

Claims priority, application Italy, May 17, 1984, 20978 A/84

Int. Cl.⁴ D04H *1/58*

U.S. Cl. 428—286 **7 Claims**



1. In a process for the production of padding in synthetic or other fibres, the improvement comprising the steps of:

first producing a web including a layer obtained by carding a mixture of fibres of polyester or other fibres with silicone treated fibres of diverse nature and origin;

treating one side of said web with a mixture of bonding agents of sticky plastic consistency which, when polymerised, create a very soft and elastic film;

spray-applying in the opposite side of said web from said one side thereof another type of bonding agent, of different nature, which is not sticky;

passing said web, thus treated through a calender composed of two or more cylinders; and

heating said cylinders whereby to cause said sticky plastic bonding agent to adhere to the facing roller in the region of separation of said web from said rollers such that said layer of fibres as caused partially to separate to create air spaces therein.

4,551,384

BOARDS

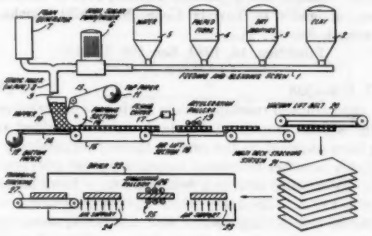
Geoffrey W. Aston, Horsham; Susan Smith, Crawley; Paul Chapman, and Howard A. Barker, both of Horsham, all of England, assignors to Redland Technology Limited, Reigate, England

Filed May 25, 1984, Ser. No. 614,208

Claims priority, application United Kingdom, Jun. 2, 1983, 8315164

Int. Cl.⁴ B32B *5/18, 9/04, 19/00*

U.S. Cl. 428—312.6 **17 Claims**



1. In a board of sandwich construction which comprises two outer preformed support membranes consisting of or comprising fibrous material, the said membranes having interposed therebetween an intermediate layer, the improvement which comprises the said intermediate layer being aerated, the said intermediate layer consisting of at least 70% by weight based on the dry board of an unfired clay which contains less than 20% by weight of expandable minerals and the said intermediate layer including fibres therein.

4,551,385

METHOD FOR PRINTING CELLULOSIC SUBSTRATES USING MODIFIED REACTIVE SILOXANES TO FORM AN OLEOPHILIC LAYER THEREON AND IMPREGNATING THEREAFTER WITH AN INK

Edward Robbart, 15 Emerson Pl., Boston, Mass. 02115

Filed Nov. 16, 1983, Ser. No. 552,315

Int. Cl.⁴ B32B *5/16;* **C23C** *11/00*

U.S. Cl. 428—323 **14 Claims**

1. In printing cellulosic substrates wherein printing ink is printed onto at least one surface of said celluosic substrate, the improvement which comprises chemically bonding a modified reactive siloxane and polymers thereof to a surface of the substrate to form an oleophilic siloxane layer thereon, and impregnating the bonded layer with an ink selected from the group consisting of solvent inks, oleoresinous inks, heat set inks, steam set inks and newsprint inks to effect printing.

4,551,386

MAGNETIC RECORDING MATERIALS

Nobutaka Yamaguchi; Shinobu Iida; Masahiro Utsumi; Toshimitu Okutu; Kenichi Masuyama, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1984, Ser. No. 596,776

Claims priority, application Japan, Apr. 4, 1983, 58-59078

Int. Cl.⁴ G11B *5/72*

U.S. Cl. 428—323 **14 Claims**

1. A magnetic recording material, comprising:

a non-magnetic support having provided on one side thereof;

a magnetic recording layer comprised of ferromagnetic particles dispersed in a binder with carbon black particles having an average primary particle size of 30 mμ or less; and

a back layer provided on the other side of the support, the

back layer being comprised of a binder having dispersed therein carbon black having an average primary particle size in the range of 50 to 150 mμ, wherein the magnetic recording layer includes the carbon black having an average particle size of 30 mμ or less in an amount in the range of 1 to 20 parts by weight per 100 parts by weight of the ferromagnetic particles.

4,551,387

COLORED RESINOUS ARTICLES WITH CONCEALED METALLIC LUSTER

Katsuhide Manabe, and Masatoshi Tsutsui, both of Ichinomiya, Japan, assignors to Toyoda Gosei Kabushiki Kaisha, Nishikasugai, Japan

Filed Sep. 14, 1983, Ser. No. 532,153
Int. Cl.⁴ B32B *27/40*
U.S. Cl. 428—336 **21 Claims**

1. A rigid colored resinous article having a concealed metallic luster which comprises (a) a rigid, resinous molded article having been overlaid on the surface thereof successively with (b) a highly weather-resistance two-component polyurethane paint or UV-curable pain as a base coat, (c) a filmy layer of a metal of 2–150 Å in thickness which has been applied onto the base coat by dry plating so that said colored resinous article transmits color of the base coat or resinous article through the filmy layer of metal has a concealed metallic luster, and (d) a transparent highly weather-resistant and abrasion-resistant two-component polyurethane paint or UV-curable paint as a top coat, either of said (a) and said (b) having incorporated thereinto a material of a desired color tint.

4,551,388

ACRYLIC HOT MELT PRESSURE SENSITIVE ADHESIVE COATED SHEET MATERIAL

James A. Schlademan, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 27, 1983, Ser. No. 508,298
Int. Cl.⁴ C09J *3/00*; **C08F** *265/04*
U.S. Cl. 428—355 **4 Claims**

1. Pressure-sensitive adhesive coated sheet material comprising a flexible backing having a coating of a thermoplastic graft copolymer of (a) 10–40 percent by weight, based on graft copolymer, of a macromolecular monomer consisting of poly(vinyl aromatic monomer) made by polymerization of vinyl aromatic monomer with an alkyllithium initiator to a poly(vinyl aromatic monomer) of number average molecular weight between 5000 and 50,000 capping with alkylene oxide and subsequent reaction with acryloyl or methacryloyl chloride to form terminal acrylate or methacrylate groups, and (b) 60–90 percent by weight, based on graft copolymer, of one or more monomers selected from the group consisting of acrylic acid, acrylamide, methacrylic acid, methacrylamide, and alkyl acrylates having 1–10 carbon atoms in the alkyl groups, whereby the terminal acrylate or methacrylate groups of said macromolecular monomer (a) are addition copolymerized with the monomer of monomer (b) to produce a graft copolymer having pendant poly(vinyl aromatic monomer) groups.

4,551,389

POROUS SPHERICAL CELLULOSE ACETATE PARTICLES

Etsuo Ohtake, Yokohama, and Kazuhiro Yamazaki, Hyogo, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 23, 1985, Ser. No. 693,720
Claims priority, application Japan, Mar. 21, 1984, 59-54004
Int. Cl.⁴ B32B *5/14, 5/16, 9/00*
U.S. Cl. 428—402 **6 Claims**

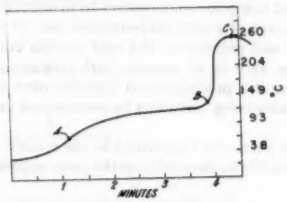
1. Porous, spherical particles of cellulose acetate, which consist essentially of a cellulose acetate having
an acetylation degree of 49 to 60%,
a particle diameter of 0.05 to 10 mm,
a sphericity of 0.7 or larger,
a pore volume of 0.4 cc/g or larger and
a collapsing strength of 9 kg or higher.

4,551,390

METHOD OF MOLDING MULTI-PLY POLYMERIC COMPOSITES

John L. Canning, Newark, and John F. Kay, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 310,555, Oct. 13, 1981, Pat. No. 4,404,261.
This application May 9, 1983, Ser. No. 492,869
Int. Cl.⁴ B32B *9/00*
U.S. Cl. 428—431 **6 Claims**



1. An article comprising a plurality of plies including at least an inner ply and a pair of outer plies positioned in contacting contiguous relationship over a desired portion of their surfaces, wherein said inner and pair of outer plies each include an unsaturated, crosslinkable polyester, a monomer and a polymerization catalyst system, the catalyst system in said inner ply exhibiting a lower initiation temperature as compared to initiation temperatures of the catalyst system in each said pair of outer plies, wherein the catalyst system in each of the plies substantially simultaneously reach their respective polymerization initiation temperatures to crosslink the polyesters within each ply when the plies are molded at elevated temperatures and pressures; wherein said catalyst systems are selected from the group consisting of aliphatic diacyl peroxides, hydroperoxides, dialkyl peroxides, peroxyketals, aromatic diacyl peroxides, peroxyesters and "azo" catalyst.

4,551,391

RUBBER COMPOSITIONS AND ARTICLES THEREOF HAVING IMPROVED METAL ADHESION AND METAL ADHESION RETENTION

Jung W. Kang, Clinton, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 20, 1984, Ser. No. 572,493
Int. Cl.⁴ B32B *15/06*
U.S. Cl. 428—462 **9 Claims**

1. A vulcanizable rubber composition devoid of rosin-derived resins having improved metal adhesion and metal adhesion retention properties with brass and brass-plated metallic reinforcing elements, the improvement wherein:
from about 0.5 to about 10.0 parts by weight of nickel molybdate, cobalt molybdate or a mixture thereof per 100 parts of the rubber component in said rubber composition is incorporated into said rubber composition prior to curing.

4,551,392

COMPOSITE MATERIALS AND COMPOSITE BUILDING ELEMENTS BASED ON EP(D)M

Adolf Draexler, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 619,448
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321176
Int. Cl.[4] B32B *27/08, 25/12*
U.S. Cl. 428—495 15 Claims

1. A composite material comprising the following two layers:

(1) a layer comprising an ethylene/propylene or ethylene/propylene/diene elastomer and an effective amount of a vulcanizing agent; and

(2) an adjoining layer comprising an elastomer component comprising 5–50% by weight of a polyoctenylene elastomer having a viscosity number (J value) of 40–350 cc/g, measured at 25° C. in tolune in a concentration of 0.5% (weight/volume of solution), and

50–95% by weight of one or more elastomers selected from the group of styrene/butadiene rubber, acrylonitrile/butadiene rubber, chlorinated polyethylene and diene elastomers,

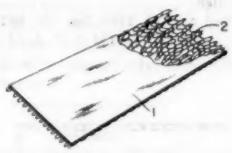
and an effective amount of a vulcanizing agent.

4,551,393

HEAT-RESISTANT SHIFT MEMBER

Kikuo Sumiyoshi; Eiji Sato, both of Fujisawa; Kazuo Hirai, Kamakura; Kingo Miyasaka, and Masayoshi Izumi, both of Ayase, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,009
Claims priority, application Japan, Aug. 16, 1982, 57-140987
Int. Cl.[4] F16J *15/12*
U.S. Cl. 428—609 3 Claims



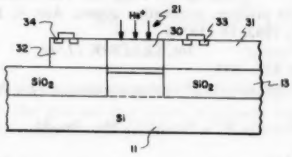
1. A heat-resistant shift member comprising: (a) a fundamental body having substantially a desired configuration formed by shaping at least one heat-resistant material selected from the group consisting of expanded graphite, mica and asbestos, together with a reinforcing material of stainless steel metal mesh so that the heat resistant material and the reinforcing material are integrally combined with each other; and (b) a shifting surface layer member formed of a heat-resistant sheet material selected from the group consisting of paper, nonwoven cloth, woven cloth composed of one or more filaments made of asbestos, carbon other than expanded graphite and glass, said heat-resistant sheet material being covered with a powdered solid lubricating compound, the heat-resistant sheet material thus covered with said lubricating compound being reinforced by a metal mesh made of fine copper alloy wires, and the surface of said fundamental body being integrally covered with said shifting surface layer member, whereby the metal meshes of said fundamental body and said shifting surface layer member are entangled with each other.

4,551,394

INTEGRATED THREE-DIMENSIONAL LOCALIZED EPITAXIAL GROWTH OF SI WITH LOCALIZED OVERGROWTH OF GAAS

Regis J. Betsch, Eden Prairie; Michael S. Liu, Bloomington, and Obert N. Tufte, Prior Lake, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 26, 1984, Ser. No. 674,903
Int. Cl.[4] H01L *21/205*
U.S. Cl. 428—641 5 Claims



1. A Si-GaAs integrated electronic structure by localized epitaxial growth comprising:

a monocrystalline silicon substrate having a planar surface coated with an insulating layer;

said insulating layer having a window down through the layer to the silicon surface thereby exposing a portion of the silicon surface;

an epitaxially-grown monocrystalline silicon island grown from said surface portion and filling said window substantially to the upper surface of the insulating layer;

an epitaxially-grown monocrystalline thin-film buffer layer grown from and over the surface of said silicon island;

an epitaxially-grown monocrystalline layer of $Al_xGa_{1-x}As$ (where $x \geqq 0$) grown from said buffer layer which layer of $Al_xGa_{1-x}As$ extends horizontally from the island over the surface of the insulating layer adjacent said window.

4,551,395

BEARING MATERIALS

Kenneth Lloyd, Grosse Pointe Park, Mich., assignor to D.A.B. Industries, Inc., Troy, Mich.

Filed Sep. 7, 1984, Ser. No. 648,466
Int. Cl.[4] C22C *9/02*; F16C *33/12*
U.S. Cl. 428—677 4 Claims

1. A bearing comprising bearing material bonded to a steel backing, said bearing material consisting essentially of 10% to 20% by weight of bismuth, 0.5% to 4% by weight of tin, 0% to 1% by weight of lead and the balance copper.

4,551,396

SLIDING MATERIAL FOR SEALS ON ROTARY REGENERATIVE HEAT EXCHANGERS WITH A CERAMIC CORE

Klaus Wiegard, Esslingen; Karlheinz Kinast, Plochingen; Wolfgang Kleinekathöfer, Waldstetten, and Eggert Tank, Wernau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,239
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331919
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—678 6 Claims

1. Sliding material for seals on rotary regenerative heat exchangers with a ceramic core formed as an alloy of the composition

Cr 15–19% by weight
Mo 5–32.5% by weight
Si 0.3–10% by weight
≦10% by weight
≦4.5% by weight

Ti ≦4.5% by weight
Ni remainder

4,551,397

ZINC SILICATE PHOSPHOR AND ELECTRON EXCITED FLUORESCENT DISPLAY DEVICE USING THE PHOSPHOR

Masachika Yaguchi; Tomoki Mikami, and Takashi Hase, all of Odawara, Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Apr. 3, 1984, Ser. No. 596,387
Claims priority, application Japan, Apr. 4, 1983, 58-58987; Jun. 27, 1983, 58-115396
Int. Cl.⁴ C09K *11/44*
U.S. Cl. 428—691 **15 Claims**

1. A zinc silicate phosphor represented by the formula:

$$(Zn_{1-x-2y}, M^{II}_x, Na_{2y})_2SiO_4:Mn_a, As_b, M_c \quad (I)$$

where M^{II} is at least one element selected from the group consisting of barium, calcium and strontium, M is at least one of antimony and bismuth, and x, y, a, b and c satisfy the conditions of $0 \leqq x \leqq 5\times10^{-2}$, $0 \leqq 2y \leqq 5\times10^{-3}$, $5\times10^{-5} \leqq a \leqq 3\times10^{-2}$, $0 \leqq b \leqq 5\times10^{-3}$ and $0 < c \leqq 1\times10^{-2}$, respectively, provided $x+2y \neq 0$, and exhibiting a higher fluorescence maintaining rate than said phosphor where $c=0$, and a higher fluorescence maintaining rate than said phosphor where $x+2y=0$.

4,551,398

TETRAALKYL TITANATE MODIFIED NYLON MAGNET WIRE INSULATION COATING

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jun. 13, 1984, Ser. No. 620,310
Int. Cl.⁴ B32B *27/00*; H01B *7/00*
U.S. Cl. 428—383 **7 Claims**

1. An electrically insulated magnet wire insulated with at least one layer of an enamel composition comprising nylon reacted with tetraalkyl titanate in an amount of about 0.25% to about 10% by weight of the nylon present in the enamel composition.

5. An electrically insulated magnet wire insulated with a layer of polyurethane which is bonded to a layer of polyvinyl butyral through a layer of an enamel composition comprising nylon reacted with tetraalkyl titanate in an amount of about 0.25% to about 10% by weight of the nylon present in the enamel composition.

4,551,399

BIPOLAR BATTERY

Aleksandar Despic, Vlajkoviceva 13, 11000 Beograd, Yugoslavia

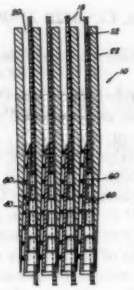
Filed May 31, 1984, Ser. No. 615,917
Claims priority, application Yugoslavia, Jun. 2, 1983, 1224/83
Int. Cl.⁴ H01M *4/00, 6/48*
U.S. Cl. 429—27 **4 Claims**

1. A bipolar storage battery employing a number of cells between a pair of parallel end walls and a pair of parallel side walls normal to the plane of said end walls, each of said cells formed between opposed cells walls each having a first and second face, said battery including:

a removable-replaceable anode including a wall contacting side and cell facing side, said wall contacting side being coplanar and abutting the first face of said one wall, said cell facing side having an upper portion generally parallel with said wall contacting side and a lower tapered portion angled inwardly and downwardly forming a wedge;

a cathode member contacting the second face of said other wall, said member including projections and spaces for air to act as an oxidant, and a face opposite said projections angularly disposed thereto toward said tapered portion and generally parallel with said lower tapered portions of said anode;

each of said side walls including slots therethrough complimentary with the projections of said cathode member and receiving said projections, said projections extending through said wall into an adjacent cell and bearing against said wall contacting side of said anode;



said wedge portion of said anode gravitationally biasing said cathode against said wall;

spacer means separating said anode and said cathode member in the same cell;

contact means interconnecting said anodes and passing to the exterior of said bettery forming one contact; and

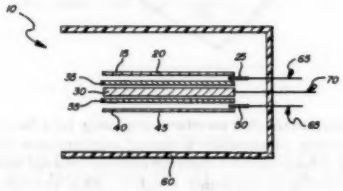
contact means interconnecting said cathodes and passing to the exterior of said battery forming another contact.

4,551,400

HYDROGEN STORAGE MATERIALS AND METHODS OF SIZING AND PREPARING THE SAME FOR ELECTROCHEMICAL APPLICATIONS

Krishna Sapru; Kuochih Hong, both of Troy; Michael A. Fetcenko, Farmington Hills, and Srinivasan Venkatesan, Royal Oak, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 17, 1984, Ser. No. 601,641
Int. Cl.⁴ H01M *4/36, 6/24*
U.S. Cl. 429—94 **59 Claims**



1. An active material for an hydrogen storage electrode, said material comprising the composition formula selected from the group consisting of:

$$(TiV_{2-x}Ni_x)_{1-y}M_y \quad (a)$$

whereas, $0.2 \leqq x \leqq 1.0$, $0 \leqq y \leqq 0.2$ and M = Al or Zr;

$$Ti_{2-x}Zr_xV_{4-y}Ni_y \quad (b)$$

whereas, $0 < x \leqq 1.5$, $0.6 \leqq y \leqq 3.5$; and

$$Ti_{1-x}Cr_xV_{2-y}Ni_y \quad (c)$$

whereas, $0<x\leqq 0.75$, $0.2\leqq y\leqq 1.0$.

4,551,401

METHOD OF SUPPRESSING LEAD DUST

Frank Wilson, Lancashire, England, assignor to Chloride, Inc., Tampa, Fla.

Filed Apr. 13, 1984, Ser. No. 600,140
Int. Cl.[4] H01M *6/00, 2/16*
U.S. Cl. 429—122 **27 Claims**

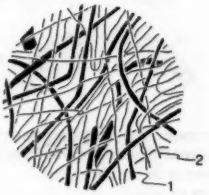
15. A substantially dust free unformed leaded plate for lead acid storage batteries comprising a lead pasted supporting grid coated with a copolymeric water insoluble porous coating made porous by applying a suspension of copolymer emulsion, ammonium sulfate and water.

4,551,402

ELECTRODE SEPARATOR FOR AN ELECTRIC CELL

Tadashi Tamura, Shiga; Etsuro Nakao, Moriyama, and Hiroaki Yamazaki, Ibaraki, all of Japan, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Nov. 16, 1983, Ser. No. 552,491
Claims priority, application Japan, Nov. 17, 1982, 57-202490
Int. Cl.[4] H01M *2/16*
U.S. Cl. 429—254 **3 Claims**



1. An electrode separator for an electric cell, comprising: a mat of a collected plurality of filaments which are continuous in the mat, each filament having segments of 2–4μ in diameter and segments of 10–30μ in diameter, the proportions of segments of 2–4μ in diameter and those of 10–30μ in diameter being 30–50% and 20–40%, respectively, of the total in a unit area of the mat of filaments.

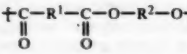
4,551,403

PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY

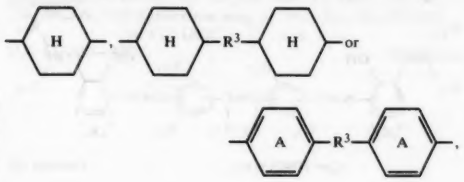
Nobuhiro Miyakawa, Abiko; Teruaki Higashiguti, Tokyo; Yumiko Sano, Ibaragi, and Masatomi Funato, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 434,120, Oct. 13, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 653,488
Claims priority, application Japan, Oct. 16, 1981, 56-164277
Int. Cl.[4] G03G *5/05*
U.S. Cl. 430—58 **16 Claims**

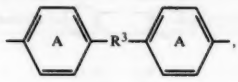
1. A photosensitive material for the electrophotography, which comprises an electroconductive substrate and a photosensitive layer formed on said substrate, said photosensitive layer comprising a charge transfer medium and a charge-generating pigment dispersed in said medium, wherein the photosensitive layer contains as the matrix resin a thermoplastic polyester consisting essentially of recurring units represented by the following general formula



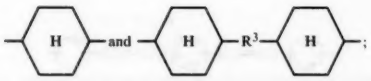
wherein R^1 stands for a phenylene group or an ethylene group, and R^2 stands for at least one group represented by the formula



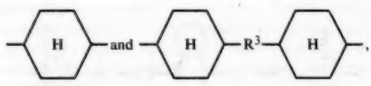
wherein the ring A may have a substituent not participating in the reaction, with the proviso that when R^1 stands for the ethylene group, R^2 stands for the group



or one or both of



and when R^1 stands for the phenylene group, R^2 stands for one or both of



wherein R^3 stands for

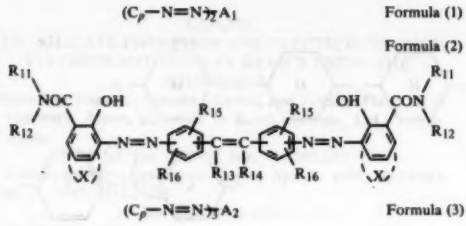
4,551,404

DISAZO ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Masaaki Hiro, Kawasaki; Yoshio Takasu, Tama; Shozo Ishikawa, Yokohama; Kazuharu Katagiri, Yokohama, and Hideyuki Takahashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha and Copyer Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,313
Claims priority, application Japan, Jun. 18, 1981, 56-129162; Aug. 18, 1981, 56-129164; Aug. 18, 1981, 56-129165; Aug. 18, 1981, 56-129166; Aug. 19, 1981, 56-130765; Aug. 19, 1981, 56-130766; Sep. 7, 1981, 56-141439; Oct. 5, 1981, 56-158478; Oct. 5, 1981, 56-158479; Nov. 25, 1981, 56-188908; Nov. 26, 1981, 56-190036
Int. Cl.[4] G03G *5/06, 5/14*
U.S. Cl. 430—59 **15 Claims**

1. An electrophotographic photosensitive member characterized by a conductive layer or substrate a charge transport layer and a layer comprising a binder and at least one azo pigment represented by the following formula (1), (2) or (3):



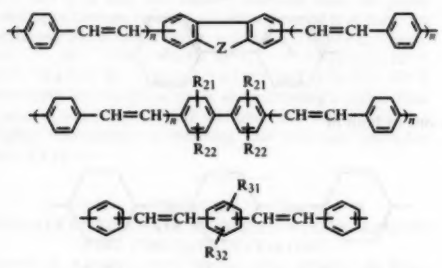
Formula (1)

Formula (2)

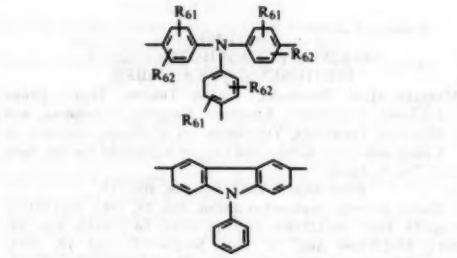
Formula (3)

in these formulae;

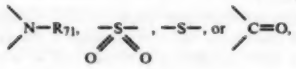
A1:



A2:



wherein, Z is



in which R_{71} is hydrogen, or substituted or unsubstituted alkyl;

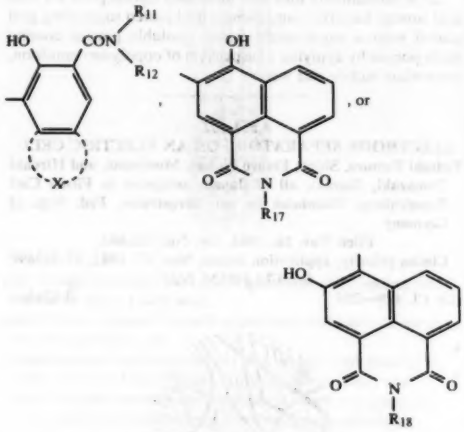
n is 0 or 1;

R_{21}, R_{22}, R_{61} and R_{62} are hydrogen, alkyl, alkoxy, nitro, or hydroxyl;

R_{31} and R_{32} are hydrogen or alkoxy; and

R_{41}, R_{42}, R_{43}, R_{44}, R_{51}, R_{52}, R_{53} and R_{54} are hydrogen, halogen, or organic monovalent residue:

Cp:



wherein X represents a residue necessary for completing an aromatic hydrocarbon ring or a hetercyclic ring, each ring being substituted or unsubstituted;

R_{11} is hydrogen or alkyl;

R_{12} is methyl, ethyl, or C_3–C_8 linear alkyl; and

R_{17} and R_{18} are alkyl, aralkyl or aryl, each substituted or unsubstituted:

in formula (2); R_{11}, R_{12} and X are as defined above;

R_{13} and R_{14} are hydrogen or cyano; and

R_{15} and R_{16} are hydrogen, halogen, alkyl, alkoxy, nitro, or hydroxyl.

4,551,405

IMAGE FORMING PROCESS EMPLOYING MEMBER WITH A DEPLETION LAYER

Katsumi Nakagawa, Tokyo; Toshiyuki Komatsu, Kawasaki; Yutaka Hirai, Tokyo; Teruo Misumi, Toride, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 269,846, Jun. 3, 1981, Pat. No. 4,461,819, which is a continuation of Ser. No. 16,986, Mar. 2, 1979, abandoned. This application Dec. 23, 1983, Ser. No. 565,146

Claims priority, application Japan, Mar. 3, 1978, 53-24628; Mar. 14, 1978, 53-29030; Apr. 28, 1978, 53-51851

Int. Cl.[4] G03G *5/14, 5/082*

U.S. Cl. 430—64 **21 Claims**

1. An electrophotographic process which comprises the steps of:

applying a charging treatment to an image forming member for electrophotography, said image forming member comprising a substrate and a charge generation layer comprising an inner region containing hydrogenated amorphous silicon and an outer region containing a hydrogenated amorphous silicon, said charge generation layer being sensitive to electromagnetic wave and having a depletion layer formed by the junction of said regions, said regions having different electric properties, said charging treatment conducted under a charging polarity sufficient to broaden the width of said depletion layer to prevent

charge carriers from being injected into the charge generation layer from the substrate, and

irradiating said image forming member with an electromagnetic wave carrying information, thereby forming an electrostatic image.

4,551,406

ELECTROPHOTOGRAPHIC RECORDING PROCESS AND PHOTOCONDUCTIVE COATING SUITABLE FOR USE THEREIN

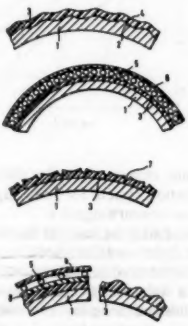
Günther Schaedlich, and Roland Moraw, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,565

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204221

Int. Cl.⁴ G03G *13/10*

U.S. Cl. 430—119 **3 Claims**



1. A method for recording electrophotographically an image on a copy carrier by using a liquid developer, comprising the steps of:

electrostatically charging and exposing a photoconductive coating in a manner whereby a charge image is generated thereon;

rendering visible said charge image as a toner image by means of a liquid developer, said developer containing dispersing liquid for the toner; and

transferring and fixing said toner image to a copy carrier;

wherein said photoconductive coating is deposited on a carrier and has a texture pattern with a surface roughness of from about 5 μm to about 50 μm and repetition lengths of from about 100 μm to about 3000 μm, said texture pattern reducing the drag-out of dispersing liquid;

wherein said carrier of the photoconductive coating is provided with texturing elements by mechanical removal, embossing, etching or spot-wise application of electrically conducting substances, said texturing elements producing textures on the photoconductive coating applied to the surface of the carrier, the texture patterns having a substantially sinusoidal cross-section; and

wherein the texture pattern is produced on the photoconductive coating by a shrinkable flexible tubing with an inserted embossing matrix of a screen printing fabric, drawn tightly over the photoconductive coating, and heated to a temperature sufficient to cause shrinkage of the tubing.

4,551,407

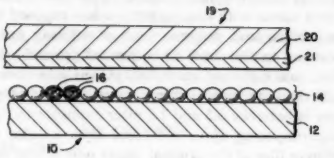
TRANSFER IMAGING SYSTEM

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 320,356, Nov. 12, 1981, Pat. No. 4,399,209. This application Aug. 3, 1983, Ser. No. 520,023

Int. Cl.⁴ G03C *1/72, 5/54, 5/16*

U.S. Cl. 430—138 **19 Claims**



1. A transfer imaging system in which images are formed by image-wise reaction of one or more chromogenic materials and a developer, said system comprising:

an imaging sheet comprising a first substrate,

a chromogenic material,

a photodepolymerizable composition which undergoes a decrease in viscosity upon exposure to actinic radiation,

a coating on one surface of said first substrate comprising said chromogenic material and said photodepolymerizable composition,

said photodepolymerizable composition being encapsulated in rupturable capsules as an internal phase, and

a developer sheet comprising a second substrate and a developer material capable of reacting with said chromogenic material to form an image on one surface of said substrate,

wherein images are formed by image-wise exposing said coating to actinic radiation, and rupturing said capsules in the exposed areas with said coating in facial contact with said developer sheet such that said internal phase is image-wise released from said ruptured capsules and there is image-wise transfer of said chromogenic material to said developer sheet and a patterned image-forming reaction occurs between said chromogenic material and said developer material.

13. A transfer imaging process comprising:

image-wise exposing to actinic radiation an imaging sheet comprising a first substrate and a coating composition of said substrate,

said coating composition including a chromogenic material and a photodepolymerizable composition which undergoes a decrease in viscosity upon exposure to actinic radiation,

said photodepolymerizable composition being encapsulated in rupturable capsules,

rupturing capsules in the exposed areas, and

transferring said chromogenic materials from the ruptured capsules to a sheet carrying a developer material on one surface such that there is a patterned reaction between said developer material and said chromogenic material which produces an image.

4,551,408

COLOR IMAGE FORMING METHOD AND COLOR IMAGE FORMING PHOTO-SENSITIVE MATERIAL TO BE USED THEREFOR

Hisashi Mino, Saitama, and Takeshi Iizima, Higashimatsuyama, both of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,881
Claims priority, application Japan, Oct. 7, 1982, 57-176752
Int. Cl.⁴ G03C *5/18, 5/00;* **G03F** *7/08*
U.S. Cl. 430—141 **1 Claim**

1. An image forming process comprising:

(a) providing a color layer upon a transparent base material, said color layer comprising a film-forming, water soluble, high molecular weight polymer, a photosensitive material which reacts with said polymer when exposed to light to insolubilize said polymer; and a coloring agent corresponding to the color to be printed from the separation plate, said coloring agent being used in a concentration such that the optical transmission density of the color layer is between 0.5 and 1.5 after exposure to light;

(b) superimposing upon said color layer a color separated negative film of the original image which is to be printed;

(c) exposing said color layer to light through said negative film;

(d) washing said color layer and base material with water to remove non-exposed, water-soluble portions and to form a color image;

(e) proofing said color image against a background; and

(f) dyeing said proofed color image with a dye such that the optical density of the color image is at least 2.5 within the range of the active rays of light.

4,551,409

PHOTORESIST COMPOSITION OF COCONDENSED NAPHTHOL AND PHENOL WITH FORMALDEHYDE IN ADMIXTURE WITH POSITIVE O-QUINONE DIAZIDE OR NEGATIVE AZIDE

Michael Gulla, Sherborn; Paul Taylor, North Andover, and Michael J. Oddi, Burlington, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Nov. 7, 1983, Ser. No. 549,286
Int. Cl.⁴ G03C *1/60, 1/71;* **G03F** *7/26*
U.S. Cl. 430—192 **22 Claims**

1. A photoresist composition comprising an admixture of a binder and a sensitizer, said binder being an alkali soluble naphthol polymer that is the product of condensation of an aldehyde and a mixed monomer consisting of a naphthol and a phenol, the binder having a naphthol content of at least 1 mole percent, and said sensitizer comprising a binder compatible and developable sensitizer selected from the group of positive working o-quinone diazide compounds and negative working azide compounds, said sensitizer being present in an amount of from 0.1 to 50 weight percent of the photoresist composition.

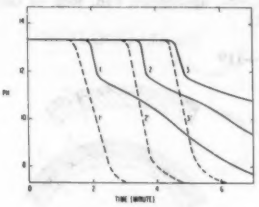
12. A photoresist composition comprising an admixture of a binder and a sensitizer, said binder being an alkali soluble admixture of an alkali soluble naphthol polymer and an alkali soluble polymer, said naphthol polymer consisting of the condensation product of an aldehyde and naphthol in combination with a phenol, said alkali soluble polymer being selected from the group of novolak resins and polyvinyl phenols, said binder having a naphthol content of at least 1 mole percent, and said sensitizer being a binder compatible and developable sensitizer selected from the group of positive working o-quinone diazide compounds and negative working azide compounds, said sensitizer being present in an amount of from 0.1 to 50 weight percent of the photoresist composition.

4,551,410

PHOTOGRAPHIC ELEMENT FOR COLOR DIFFUSION TRANSFER WITH TWO NEUTRALIZING LAYERS

Hideki Tomiyama, and Masaki Satake, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 16, 1984, Ser. No. 631,113
Claims priority, application Japan, Jul. 14, 1983, 58-128224
Int. Cl.⁴ G03C *5/54, 1/40*
U.S. Cl. 430—215 **23 Claims**



1. A photographic element for color diffusion transfer comprising a neutralization system for reducing pH of an alkaline processing solution, comprising:

an element comprising an integral laminate film unit comprising (1) a light-sensitive sheet comprising a support having coated thereon, in succession, an image-receiving element and a light-sensitive element containing at least one silver halide emulsion layer in association with a dye image-providing compound; (2) a cover sheet comprising a neutralization system and (3) a processing element comprising an alkaline processing solution capable of being spread between said light-sensitive elements and said cover sheet to develop and transfer an image;

wherein said neutralizing system comprises a neutralization layer, an auxiliary neutralization layer and one or two timing layers;

wherein the alkaline processing solution reaches said neutralization layer and said auxiliary neutralization layer through at least one timing layer;

wherein neutralization of said processing solution in said neutralization system is divided into at least two steps in such a manner that:

in the first step the pH of said processing solution is reduced in said auxiliary neutralization layer to a range in which development and dye release reactions are substantially discontinued, but in which diffusion of a dye for forming transfer images continues, and

in the second step, the pH of said processing solution is further reduced in said neutralization layer at a rate lower than in the first step to a final pH in which the transfer image formed is stabilized; and

wherein when two timing layers are present, said neutralization system is coated on a support and comprises, in succession, said neutralizing layer, a second timing layer said auxiliary neutralizing layer and a first timing layer wherein said first timing layer has a positive temperature coefficient.

4,551,411

SEQUESTRANTS USED IN DIFFUSION TRANSFER ELEMENTS WITH METALLIZABLE DYES

David P. Brust; Stephen M. Neumann, both of Rochester, and Edward Weissberger, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1984, Ser. No. 687,415
Int. Cl.[4] G03C *1/40, 5/54*
U.S. Cl. 430—216 21 Claims

1. In a photographic assemblage comprising:

(a) a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a metallizable redox dye-releaser;

(b) a dye image-receiving layer;

(c) an alkaline processing composition and means containing same for discharge within said assemblage; and

(d) a transparent cover sheet located over the layer outermost from said support;

said assemblage containing an electron transfer agent; the improvement wherein said assemblage contains a sequestering agent which is gluconic acid, $N[CH_2—P(O)(OH)_2]_3$ or $(HO)_2P(O)—C(CH_3)(OH)—P(O)(OH)_2$.

4,551,412

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL FOR PHOTOMECHANICAL PROCESS AND METHOD OF REDUCTION TREATMENT THEREFORE

Masaki Ogawa; Taku Nakamura; Yukihide Urata, and Shingo Yamauchi, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 17, 1983, Ser. No. 524,001
Claims priority, application Japan, Aug. 17, 1982, 57-142464
Int. Cl.[4] G03C *1/48*
U.S. Cl. 430—265 27 Claims

1. A silver halide photographic light-sensitive material for photo-mechanical process comprising a support having thereon at least one light-sensitive silver halide emulsion layer and at least one light-insensitive upper layer which is positioned above the light-sensitive silver halide emulsion layer, wherein at least one of the light-insensitive upper layers has a melting time longer than a melting time of the light-sensitive silver halide emulsion layer and at least one of the light-insensitive upper layers contains a polymer latex, wherein the polymer latex is a polymer latex having a glass transition temperature higher than room temperature, whereby antiadhesive property is improved.

23. A method of reduction treatment for a silver halide photographic light-sensitive material for photo-mechanical process comprising the steps of:

exposing a silver halide photographic light-sensitive material, wherein the silver halide photographic light-sensitive material comprises a support having thereon at least one light-sensitive silver halide emulsion layer and at least one light-insensitive upper layer which is positioned above the light-sensitive silver halide emulsion layer, wherein at least one of the light-insensitive upper layers has a melting time longer than a melting time of the light-sensitive silver halide emulsion layer and at least one of the light-insensitive upper layers contains a polymer latex, wherein the polymer latex is a polymer latex having a glass transition temperature higher than room temperature, whereby antiadhesive property is improved,

development processing the exposed silver halide photographic light-sensitive material to form a silver image, and carrying out reduction treatment of the silver image.

4,551,413

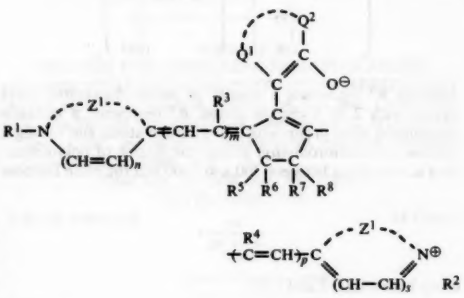
RECORDING ELEMENT FOR OPTICAL DATA STORAGE

Vivien L. Bell, London, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1983, Ser. No. 564,938
Claims priority, application United Kingdom, Dec. 31, 1982, 8237040
Int. Cl.[4] G03C *5/24*
U.S. Cl. 430—270 25 Claims

1. An optical recording element on which information can be recorded and read directly afterwards by means of laser light characterized in that the element comprises, as a recording medium, a substrate having coated thereon and adhered thereto an amount of one or more dyes sufficient to enable optical differentiation between areas exposed and unexposed to a laser beam, said dyes having the formula:

(I)



in which:

m+p=2,

n is 0 or 1,

s is 0 or 1,

Z^1 and Z^2 independently represent the non-metallic atoms necessary to complete a heterocyclic nucleus of the type present in cyanine dyes,

R^1 and R^2 independently represent an alkyl or substituted alkyl, alkenyl, substituted alkenyl or aralkyl group of up to 20 carbon atoms,

R^3 and R^4 independently represent a hydrogen atom or an alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkoxy or substituted alkoxy group of up to 10 carbon atoms,

R^5, R^6, R^7 and R^8, which together may not contain more than 12 carbon atoms, independently represent a hydrogen atom, an alkyl, substituted alkyl, alkenyl, substituted alkenyl, aryl, alkaryl or substituted alkaryl group, or

one of R^5 and R^6 together with one of R^7 and R^8 represent the necessary atoms to complete a carbocyclic ring in which case the others of R^5 to R^8 are absent,

Q^1 and Q^2 together represent the non-metallic atoms necessary to complete an acidic nucleus of the type present in oxonol or merocyanine dyes.

4,551,414
POSITIVE RESIST MATERIAL

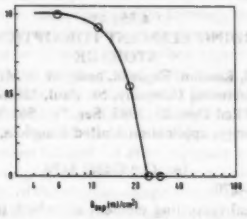
Frithjof Asmussen; Hideto Sotobayashi; Jiang-Tsun Chen, and Wolfram Schnabel, all of Berlin, Fed. Rep. of Germany, assignors to Max-Planck-Gesellshaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,437

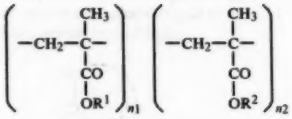
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206633; Dec. 17, 1982, 3246825

Int. Cl.⁴ G03C *1/495, 5/16, 18/02, 18/20*

U.S. Cl. 430—270 **7 Claims**



1. A positive resist material of a thermally crosslinkable methacrylic polymer soluble in an organic solvent wherein the methacrylic polymer is a copolymer of the formula



wherein R^1 represents a wholly or partly fluorinated alkyl group with 2 to 6 carbon atoms, R^2 represents a partially chlorinated alkyl group with 2 to 6 carbon atoms and having a terminal ω-trichloromethyl group, the degree of polymerization n_1+n_2 being between 300 and 3000 and the mole fraction

$$\frac{n_2}{n_1 + n_2}$$

being between 0.02 and 0.20.

4,551,415
PHOTOSENSITIVE COATINGS CONTAINING CROSSLINKED BEADS

Abraham B. Cohen, Springfield, N.J., and Vincent J. Webers, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 370,991, Apr. 22, 1982, abandoned. This application May 18, 1984, Ser. No. 611,870

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—281 **9 Claims**

1. A photosensitive coating composition consisting essentially of

(a) 5 to 45% by weight based on the weight of components (a) to (d) of at least one nongaseous, ethylenically unsaturated compound having at least one terminal ethylenic group, said compound being capable of forming a high polymer by free-radical initiated, chain-propagating addition polymerization;

(b) 0.05 to 10% by weight based on the weight of components (a) to (d) of an organic, radiation-sensitive, free-radical generating system, activatable by actinic radiation which initiates polymerization of the unsaturated compound;

(c) at least one organic polymeric binder;

(d) discrete, substantially nonswellable crosslinked polymeric beads having an average diameter in the range of 0.02 to 4.0 μm, wherein at least 90% of the beads by population are below 6 μm, the beads being insoluble and nonagglomerating in a solvent for the organic polymeric binder component, said crosslinked polymeric beads are taken from the class consisting of homopolymers and copolymers of tri-, and tetraacrylate, and tri-, and tetramethacrylate monomers which contain three or more free-radical polymerizable double bonds per molecule, copolymers of at least one of said acrylate and methacrylate monomers and up to 25% by weight of at least one monomer having one terminal ethylenic group, and copolymers of at least one of said acrylate and methacrylate monomers and up to 75% by weight of at least one monomer having two terminal ethylenic groups, the total weight percent of the combination of components (c) and (d) based on the total weight of components (a) to (d) being 40 to 70% by weight, component (d) being present in an amount of 15 to 90% by weight based on the weight of components (c) and (d); and

(e) at least one solvent for components (a), (b) and (c), the crosslinked polymeric beads being resistant to absorbing or being plasticized by any component or mixture of components of the coating composition, being mutually compatible with the dissolved ingredients a, b, c and e of the coating composition in which said beads are dispersed.

4,551,416
PROCESS FOR PREPARING SEMICONDUCTORS USING PHOTOSENSITIVE BODIES

Edwin A. Chandross, Berkeley Heights; Elsa Reichmanis, Piscataway, and Cletus W. Wilkins, Jr., Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

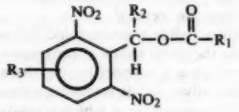
Continuation-in-part of Ser. No. 265,554, May 22, 1981, Pat. No. 4,400,461. This application Apr. 29, 1983, Ser. No. 489,796

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—311 **11 Claims**

1. A process for preparing a semiconductor device comprising the steps of depositing a photosensitive material on a substrate comprising a semiconductor material, irradiating said photosensitive material with electromagnetic radiation in a desired pattern, developing said pattern with an alkaline composition, and completing the fabrication of said semiconductor device wherein said photosensitive material comprises a mixture of an o,o'-dinitroarylmethyl ester of a carboxylic acid and a polymer which is soluble in said alkaline composition, said o,o'-dinitroarylmethyl ester being represented by the formula



where R_1 is a substituent chosen so that a salt of the carboxylic acid, R_1COOH, is sufficiently soluble in water to produce at least a 0.01M solution and R_1, R_2 and R_3 are chosen so that the ratio expressed as 1:n of the solubility rate of said unexposed to said exposed portions is such that n is at least 4.

4,551,417

METHOD OF FORMING PATTERNS IN MANUFACTURING MICROELECTRONIC DEVICES

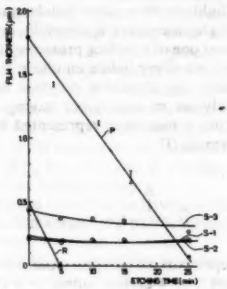
Masayoshi Suzuki, and Kazuhide Saigo, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,201

Claims priority, application Japan, Jun. 8, 1982, 57-98089; Jun. 8, 1982, 57-98090; Jul. 16, 1982, 57-123865; Jul. 16, 1982, 57-123866; Nov. 5, 1982, 57-194286

Int. Cl.[4] G03C 5/16

U.S. Cl. 430—316 21 Claims



1. A method of forming a pattern in the manufacture of microelectronic devices, the method comprising the steps of:

forming an organic polymer layer which can be etched by dry etching on a substrate to ultimately be etched;

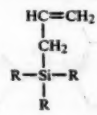
forming a resist film directly on said organic polymer layer, the material of said resist film being a polymer comprising a trialkylsilyl group and being formed by using a monomer selected from the group consisting of monomers of formula (I), monomers of formula (II), and monomers of formula (III), and forming a desired pattern in said resist film by using a lithography technique such that the number of said substituted silyl groups in the patterned resist film is at least 1×10^{16} per 1 cm^2;

etching said organic polymer layer by a dry etching technique with the patterned resist film as a mask; and

etching said substrate with the unetched areas of said organic polymer layer as a mask;

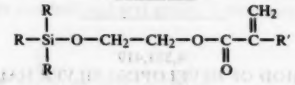
wherein formula (I) is:

formula (II) is



and formula (III) is

-continued

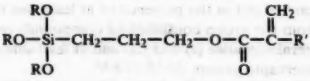


where R represents a lower alkyl group, and R′ represents a hydrogen atom or a lower alkyl group.

11. A method of forming a pattern in the manufacture of microelectronic devices, the method comprising the steps of:

forming an organic polymer layer which can be etched by dry etching on a substrate to ultimately be etched;

forming a resist film directly on said organic polymer layer, the material of said resist film being a polymer comprising a trialkoxysilyl group and being formed by using a monomer of



where R represents a lower alkyl group, and R^3 represents a hydrogen atom or a lower alkyl group, and forming a desired pattern in said resist film by using a lithography technique such that the number of said substituted silyl groups in the patterned resist film is at least 1×10^{16} per 1 cm^2;

etching said organic polymer layer by a dry etching technique with the patterned resist film as a mask; and

etching said substrate with the unetched areas of said organic polymer layer as a mask.

4,551,418

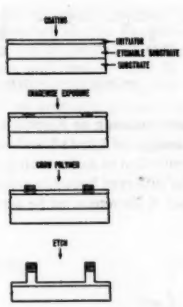
PROCESS FOR PREPARING NEGATIVE RELIEF IMAGES WITH CATIONIC PHOTOPOLYMERIZATION

Anders Hult, Täby, Sweden; Hiroshi Ito, San Jose, Calif.; Scott A. MacDonald, San Jose, Calif., and Carlton G. Willson, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,514

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—325 14 Claims



1. A process for generating a negative tone resist image comprising the steps of:

(1) coating a substrate with a film that contains a cationic photoinitiator;

(2) exposing the film in an imagewise fashion to radiation and thereby generating cationic initiator in the exposed regions of the film;

(3) treating the exposed film with a cationicsensitive monomer to form a film of polymer resistant to plasma etching; and

(4) developing the resist image by etching with a plasma.

4,551,419
METHOD OF DEVELOPING SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tadao Sugimoto; Hideo Ikeda, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 10, 1984, Ser. No. 579,048
Claims priority, application Japan, Feb. 10, 1983, 58-21269
Int. Cl.⁴ G03C 5/26
U.S. Cl. 430—445 **26 Claims**

1. A method for surface development-processing a silver halide photographic material containing a surface latent image light-sensitive silver halide emulsion and an internally fogged silver halide emulsion, in which the surface development-processing is carried out in the presence of at least one compound selected from the group consisting of compounds represented by the general formulae (I) and (II) and at least one azaindene having a mercapto group:

$$R_1\text{-}\{(R_3)_l X\}_n R_3'\text{—}R_2 \qquad (I)$$

wherein R_1 and R_2 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group; R_3 and R_3' each represents a substituted or unsubstituted alkylene group, a substituted or unsubstituted arylene group, and a substituted or unsubstituted divalent heterocyclic group; X represents

$$\text{—S—, —O—, —}\overset{\overset{O}{\|}}{C}\text{—O—, —}\overset{\overset{O}{\|}}{C}\text{—, —}SO_2\text{—, —}CONR_4\text{—,}$$

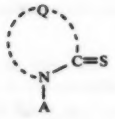
$$\text{—}NR_4\overset{\overset{O}{\|}}{C}NR_4\text{—, —}SO_2NR_4\text{—, —}NR_4\text{—, —}CHR_4\text{ or —}C(R_4)_2\text{—;}$$

R_4 represents a hydrogen atom or $\text{—}R_5\text{—}Y\}_m R_5'\text{—}R_6$; R_5 and R_5' have the same meanings as R_3 and R_3'; R_6 has the same meaning as R_1 and R_2; Y represents

$$\text{—S—, —O—, —}\overset{\overset{O}{\|}}{C}\text{—O—, —}SO_2\text{—, —}\overset{\overset{O}{\|}}{C}\text{—, —}NR_7\text{—,}$$

$$\text{—}CONR_7\text{—, —}NR_7CONR_7\text{—, or —}SO_2NR_7\text{;}$$

R_7 has the same meaning as R_1 and R_2; l represents 0 or 1, n represents an integer of 1 to 110, and m represents an integer of 0 to 10, wherein when m and n each is not less than 2, X, Y, R_3 and R_5 may be different between repeating units respectively and at least one X therein must be a sulfur atom:



(II)

wherein Q represents atoms necessary to form a heterocyclic ring which may be substituted, and A represents a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, wherein said azaindene is selected from the group consisting of tetrazaidenes, triazaidenes, pentazaindenes, and purines, and wherein said compounds represented by formula (II) are other than said at least one azaidene having a mercapto group.

4,551,420
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Naohiko Sugimoto, and Tetsuro Kojima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 541,183, Oct. 12, 1983, abandoned.
This application Feb. 1, 1985, Ser. No. 698,251
Claims priority, application Japan, Oct. 12, 1982, 57-178788
Int. Cl.⁴ G03C 1/78
U.S. Cl. 430—505 **28 Claims**

1. A silver halide photographic light-sensitive material comprising:

a support having thereon;

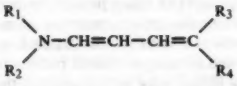
at least one light-sensitive silver halide emulsion layer; and

at least one light-insensitive hydrophilic colloid layer;

wherein at least one of a surface protective layer, an intermediate layer or a silver halide emulsion layer contains (A) an ultraviolet ray absorbing polymer latex which comprises a polymer or copolymer having a repeating unit derived from a monomer represented by the following general formula (I):

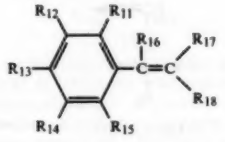
$$CH_2\text{=}\overset{\overset{R}{|}}{C}\text{—X}\text{+A}\text{+}_m\text{+Y}\text{+}_n\text{Q}$$

herein R represents a hydrogen atom, a lower alkyl group having from 1 to 4 carbon atoms or a chlorine atom; X represents —CONH—, —COO— or a phenylene group; A represents a linking group selected from an alkylene group having from 1 to 20 carbon atoms; Y represents —COO—, —OCO—, —CONH—, —NHCO—, $\text{—}SO_2NH\text{—}$, $\text{—}NHSO_2\text{—}$, $\text{—}SO_2\text{—}$ or —O—; m represents 0 or an integer of 1; n represents 0 or an integer of 1; and Q represents an ultraviolet ray absorbing group represented by a general formula selected from the group consisting of (II) and (III):



(II)

wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms, provided that the both of R_1 and R_2 do not simultaneously represent hydrogen atoms, and further R_1 and R_2 may combine to form an atomic group necessary to form a cyclic amino group; R_3 represents a cyano group, $\text{—}COOR_5$, $\text{—}CONHR_5$, $\text{—}COR_5$ or $\text{—}SO_2R_5$; and R_4 represents a cyano group, $\text{—}COOR_6$, $\text{—}CONHR_6$, $\text{—}COR_6$, or $\text{—}SO_2R_6$; wherein R_5 and R_6 each represents an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms, and further R_5 and R_6 may combine to form an atomic group necessary to form a 1,3-dioxocyclohexane nucleus, a 1,3-diaza-2,4,6-trioxocyclohexane nucleus (a barbituric acid nucleus), a 1,2-diaza-3,5-dioxocyclopentane nucleus or a 2,4-diaza-1-alkoxy-3,5-dioxocyclohexene nucleus; and at least one of R_1, R_2, R_3 and R_4 bonds to the vinyl group through the linking group;



(III)

wherein R_{11}, R_{12}, R_{13}, R_{14}, R_{15} each represents a hydrogen atom, a halogen atom, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 20 carbon atoms, an alkoxy group having from 1 to 20 carbon atoms, an aryloxy group having from 6 to 20 carbon atoms, an alkylthio group having from 1 to 20 carbon atoms, an arylthio group having from 6 to 20 carbon atoms, an amino group, an alkylamino group having from 1 to 20 carbon atoms, an arylamino group having from 6 to 20 carbon atoms, a hydroxyl group, a cyano group, a nitro group, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfamoyl group, a sulfonamide group, an acyloxy group or an oxycarbonyl group, and R_{11} and R_{12}, R_{12} and R_{13}, R_{13} and R_{14} or R_{14} and R_{15} may form a 5- or 6-membered ring by ring closure; R_{16} represents a hydrogen atom or an alkyl group having from 1 to 20 carbon atoms; R_{17} represents a cyano group, $—COOR_{19}$, $—CONHR_{19}$, $—COR_{19}$ or $—SO_2R_{19}$; R_{18} represents a cyano group, $—COOR_{20}$, $—CONHR_{20}$, $—COR_{20}$ or $—SO_2R_{20}$; wherein R_{19} and R_{20} each represents an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms; wherein one of R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{17} and R_{18} bonds to the vinyl group through the linking group;

wherein a fine grained silver halide having a diameter of 0.2 microns or less is present in a photographic layer other than a silver halide emulsion layer; and

wherein the ultraviolet ray absorbing polymer latex is present in an amount within the range of from 10 to 2,000 mg/m^2 of the material.

4,551,421

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Tadao Sugimoto; Hideo Ikeda, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1984, Ser. No. 579,321
Claims priority, application Japan, Feb. 14, 1983, 58-22372
Int. Cl.[4] G03C *1/28*
U.S. Cl. 430—509 **21 Claims**

1. A silver halide photographic material comprising a support having thereon at least one silver halide layer comprising a support having thereon at least one silver halide emulsion layer, wherein the photographic material contains in the same emulsion layer or in separate layers

(1) internally fogged silver halide grains,

(2) Surface latent image silver halide grains more sensitive than the internally fogged silver halide grains, and

(3) at least one of the compounds represented by the following general formula (I)

$$R_1\text{—}[(R_3)_l\text{—}X]_m\text{—}R_3'\text{—}R_2 \qquad (I)$$

wherein R_1 and R_2 each represents a substituted or unsubstituted alkyl group having a hydroxy group, a substituted or unsubstituted aryl group having a hydroxy group, or a substituted or unsubstituted heterocyclic ring having a hydroxy group; R_3 and R_3' each represents a substituted or unsubstituted alkylene group, a substituted or unsubstituted arylene group, a substituted or unsubstituted heterocyclic ring, or a combination of them; X represents

$$—S—,\ —O—,\ —\overset{O}{\overset{\|}{C}}—O—,\ —\overset{O}{\overset{\|}{C}}—,\ —SO_2—,\ —CONR_4—,$$

$$—NR_4\overset{O}{\overset{\|}{C}}NR_4—,\ —SO_2NR_4—,\ —NR_4—,\ —CHR_4—,\ \text{or}$$

$$—C(R_4)_2—,$$

wherein, R_4 represents a hydrogen atom or $[R_5\text{—}Y\text{—}]_m R_5'\text{—}R_6$; R_5 and R_5' have the same significance as R_3 and R_3'; R_6 represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group; Y represents

$$—S—,\ —O—,\ —\overset{O}{\overset{\|}{C}}—O—,\ —SO_2—,\ —\overset{O}{\overset{\|}{C}}—,$$

$$—NR_7CONR_7—,\ \text{or}\ —SO_2NR_7—;$$

R_7 has the same significance as R_6; and m represents an integer of 0 to 10; l represents 0 or 1; and n represents an integer of 1 to 110; in the formula, when n is 2 or more X and R_3 each may be the same or different, when m is 2 or more Y and R_5 each may be the same or different and at least one X is a sulfur atom said at least one of the compounds represented by formula (I) is present in an amount sufficient to provide an image having a high maximum density at a high speed and a high contrast.

4,551,422

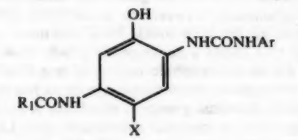
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshihiko Kimura, Hachioji; Yutaka Kaneko, Sagamihara, and Takashi Sasaki, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 572,767, Jan. 23, 1984, abandoned. This application Dec. 21, 1984, Ser. No. 684,981
Claims priority, application Japan, Jan. 29, 1983, 58-13140
Int. Cl.[4] G03C *7/26*
U.S. Cl. 430—551 **15 Claims**

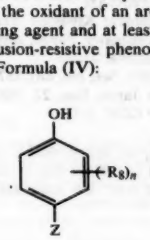
1. A silver halide photographic light-sensitive material comprising a support bearing thereon at least one silver halide emulsion layer, said silver halide photographic light-sensitive material characterized in that said silver halide emulsion layer contains at least one phenol cyan coupler having the Formula (I)

Formula (I)



wherein, R_1 represents a ballast radical necessary for endowing the phenol cyan coupler having Formula (I) and a cyan dye produced by the coupler with diffusion-resistance; Ar represents an aryl radical; and X represents hydrogen or a radical capable of splitting off when coupling to the oxidant of an aromatic primary amine color developing agent and at least one non-color-developable and diffusion-resistive phenol compound having the following Formula (IV):

Formula IV



wherein, Z represents an alkyl radical, an alkenyl radical, an aryl radical, a cycloalkyl radical, an alkylcarbonyl radical, an arylcarbonyl radical, an alkoxycarbonyl radical, an aryloxycarbonyl radical or a cyano radical; R_8 represents a monovalent radical capable of substituting a hydrogen atom of the phenol ring of said compound selected from the group consisting of halogen, alkyl, aryl, heterocyclic, alkoxy, aryloxy, alkylcarbonyloxy, arylcarbonyloxy, hydroxycarbonyl, alkoxycarbonyl, aryloxycarbonyl, alkylthio, alkylcarbonyl, arylcarbonyl, acylamino, sulfona-

mide, carbamoyl, nitro, cyano, alkysulfonyl, alkenyl and cycloalkyl radical, provided that when said phenol compound has two substituents represented by R_8 at the both ortho positions of hydroxy group thereof at the same time, said two substituents are unsubstituted normal or secondary alkyl radicals respectively and n is 2.

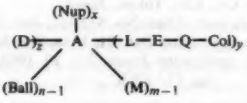
4,551,423

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL WITH NUCLEOPHILIC DISPLACEMENT DYE RELEASERS

Koichi Koyama; Yasuhiro Noguchi, and Masaharu Toriuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1984, Ser. No. 597,623
Claims priority, application Japan, Apr. 6, 1983, 58-60289
Int. Cl.⁴ G03C *1/40, 5/54*
U.S. Cl. 430—559 **17 Claims**

1. A photographic light-sensitive material comprising a support having provided thereon at least one light-sensitive silver halide emulsion layer in combination with an immobile LDA compound represented by the following general formula (I):



(I)

wherein n, x, y and z each stands for an integer of 1 or 2; m stands for an integer of 1 or more; D stands for a group containing an electron doner or its precursor moiety that forms an electron donor under alkaline conditions; A stands for an organic group linking Nup to -E-Q-Col and D so as to permit an intramolecular redox reaction between the electron donor group and the nucleophilic precursor group and intramolecular nucleophilic displacement between the nucleophilic group and the electrophilic group; Nup stands for a precursor of a nucleophilic group that forms a nucleophilic group upon reduction; E stands for an electrophilic center; Q is a divalent group; Col stands for a group containing a dye or its precusor moiety; Ball stands for a ballast group; L stands for a linking group; and M stands for an optional substituent, said LDA compound being capable of releasing a diffusible dye or its precursor upon redox reaction.

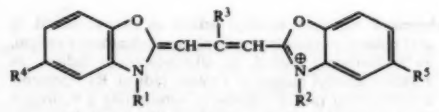
4,551,424

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tadashi Ikeda; Kenichi Kuwabara; Kiyohiko Yamamuro, and Tadayoshi Kokubo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 14, 1984, Ser. No. 681,757
Claims priority, application Japan, Dec. 22, 1983, 58-242716
Int. Cl.⁴ G03C *1/02*
U.S. Cl. 430—588 **10 Claims**

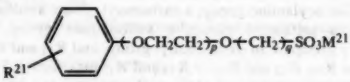
1. A silver halide photographic light-sensitive material comprising a support and at least one silver halide emulsion layer on the support, containing at least one sensitizing dye represented by formula (I)



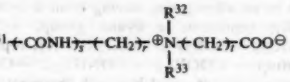
(I)

wherein R^1 and R^2 each represents a lower alkyl group substituted by a sulfo group, a carboxy group, or a hydroxyl group, provided that at least one of R^1 and R^2 represents a sulfoalkyl group; R^3 represents a hydrogen atom, a lower alkyl group, or a substituted or unsubstituted phenethyl group; R^4 represents a chlorine atom, a methoxy group, an ethoxy group, or a hydrogen atom; R^5 represents a chlorine atom, a phenyl group, a lower alkoxy group, or a lower alkyl group;

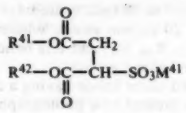
wherein at least one of the silver halide emulsion layer and other hydrophilic colloid layers contains at least one compound represented by formula (II), (III), (IV), or (V)



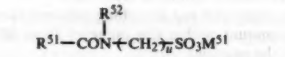
(II)



(III)



(IV)



(V)

wherein R^{21} represents an alkyl or alkenyl group having from 4 to 16 carbon atoms; R^{31} and R^{51} each represents an alkyl or alkenyl group having from 5 to 17 carbon atoms; R^{32} and R^{33} each represents an alkyl group having 4 or less carbon atoms, or a hydroxyalkyl group, provided that the total number of carbon atoms of R^{32} and R^{33} is 5 or less; R^{41} and R^{42} each represents an alkyl or alkenyl group having from 4 to 12 carbon atoms, provided that the total number of carbon atoms in R^{41} and R^{42} is 18 or less; R^{51} represents an alkyl or alkenyl group having from 5 to 17 carbon atoms; R^{52} represents a methyl group, an ethyl group, or a propyl group; p is an integer of from 1 to 11; q is 2, 3, or 4; r is an integer of from 2 to 8; s is 0 or 1; t is 1, 2, or 3; u is 2, 3, or 4; and M^{21}, M^{42} and M^{51} each represents a hydrogen atom or an alkali metal atom;

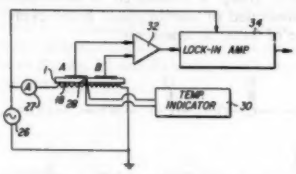
and the silver halide grains contained in the silver halide emulsion are substantially tetradecahedral grains in which the proportion of (100) faces is at least 50%.

4,551,425

PYROELECTRIC GAS SENSOR

Jay N. Zemel, Jenkintown, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Sep. 28, 1982, Ser. No. 425,400
Int. Cl.⁴ C12Q *1/00*; G01N *25/32, 25/48*
U.S. Cl. 435—4 **20 Claims**



1. A pyroelectric fluid sensor for determining at least the presence of a fluid in a test medium, said sensor comprising:

a pyroelectric substrate;

first electrode means for deriving a signal from said pyro-

electric substrate when the temperature of said substrate changes;

means for fluctuating the temperature of said pyroelectric substrate during heating to a maximum temperature during sensing for the presence of said fluid in said test medium;

temperature dependent means for absorbing and for desorbing said fluid, said absorbing/desorbing means in thermal contact with said substrate; and

means for recording and comparing said signal when said absorbing/desorbing means is exposed to a fluid-free test medium with said signal when said absorbing/desorbing means is exposed to a test medium in which the presence of said fluid is to be determined and for indicating any difference in said signals.

4,551,426

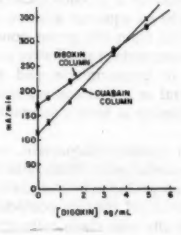
HETEROGENEOUS IMMUNOASSAY FOR DIGOXIN USING OUABAIN AS A SEPARATION MEANS

William J. Freytag, Wilmington, Del., and Shung-Ho Chang, Encinitas, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 538,772, Oct. 3, 1983, abandoned. This application Jan. 18, 1984, Ser. No. 571,966

Int. Cl.⁴ G01N *33/54, 33/56*

U.S. Cl. 435—7 **20 Claims**



1. A noncompetitive immunoassay for the measurement of digoxin in a test sample, said assay comprising the steps of:

(a) forming a reaction mixture by contacting a molar excess of labeled monovalent or divalent anti-digoxin antibody with the test sample, whereby a fraction of said antibody forms a complex with the digoxin and a fraction remains free; and

(b) contacting the reaction mixture with a solid phase having ouabain immobilized thereon, the ouabain being present in an amount capable of binding all of the free antibody, whereby the free antibody is bound to the solid phase; and

(c) measuring the amount of complex which elutes from the solid phase by measuring the activity of the label.

4,551,427

PROCESS AND REAGENT FOR THE DETERMINATION OF BLOOD GLUCOSE IN HAEMOLYSED WHOLE BLOOD

Brigitte Draeger, Tutzing, and Joachim Ziegenhorn, Starnberg, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,409

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303098

Int. Cl.⁴ C12Q *1/54*

U.S. Cl. 435—14 **17 Claims**

1. In a process for the determination of D-glucose in a blood sample by reaction with ATP in the presence of hexokinase, glucose-6-phosphate dehydrogenase, NADP, Mg^{++} ions and buffer and measurement of the NADPH formed, the improvement comprising, before reaction with ATP, the step of mixing the blood sample with 0.01 to 0.5% weight/volume of an alkyl sulphate, an alkyl sulphonate or an alkyl-aryl sulphonate, wherein the alkyl radicals contain 8 to 32 carbon atoms and are unsubstituted or substituted by one or more hydroxyalkylamino radicals as substituents and are uninterrupted or interrupted by one or more ether-oxygen atoms and the alkyl-aryl radicals contain 8 to 18 carbon atoms in the alkyl moiety.

9. A reagent for use in an improved method for determination of D-glucose in a blood sample of the type wherein the blood sample is reacted with ATP in the presence hexokinase, glucose-6-phosphate dehydrogenase, NADP, Mg^{++} ions and buffer, whereafter the NADPH formed is measured, the improvement being in reacting the blood sample with said reagent before reaction with ATP; said reagent comprising, effective amounts of

alkyl sulphate or sulphonate or alkyl-aryl sulphonate, wherein the alkyl radicals contain 8 to 32 carbon atoms and are unsubstituted or substituted by one or more hydroxyalkylamino radicals as substituents, and are uninterrupted or interrupted by one or more ether-oxygen atoms and the alkyl-aryl radicals contain 8 to 18 carbon atoms in the alkyl moiety, and

a preserving reagent selected from the group consisting of alkali metal azides, thiocid, chlorhexidine and imidazoline-urea.

4,551,428

AGENT FOR THE DETERMINATION OF ESTEROLYTIC AND/OR PROTEOLYTIC ENZYMES

Dieter Berger, Viernheim; Günter Frey, Ellerstadt; Wolfgang-Reinhold Knappe, Bürstadt; Manfred Kuhr, Mannheim; Walter Rittersdorf, Mannheim, and Wolfgang Werner, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed May 5, 1981, Ser. No. 260,616

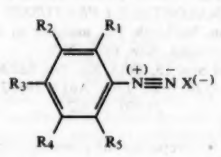
Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017721

Int. Cl.⁴ C12Q *1/44, 1/38, 1/02, 1/04, 1/06*

U.S. Cl. 435—19 **22 Claims**

1. Agent for the detection of esterolytic and proteolytic enzymes comprising an esterase or protease or combination thereof, detection reagent and a buffer, the detection reagent being a combination of a substituted diazonium salt and an ester compound; wherein

said diazonium salt is a compound of the formula:



in which

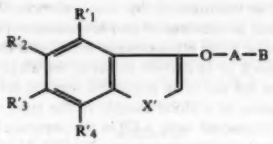
R_1 is a lower alkyl, lower alkoxy, lower alkylthio, N-morpholino, N-thiomorpholino, N-pyrrolidino, N-alkylated N-piperazino, N-piperazino or N-piperidino radical or is a halogen or hydrogen atom;

R_3 is a lower alkyl, lower alkoxy, aryloxy, lower alkylthio, alkylamino, dialkylamino, hydroxyl, N-morpholino, N-thiomorpholino, N-pyrrolidino, N-piperazino, N'-alkylated N-piperazino, N-piperidino or phenylamino radical or a phenyl radical or phenyl substituted with a lower alkyl or lower alkoxy radical, or is a hydrogen or halogen atom;

R_2, R_4 and R_5, which may be the same or different, are lower alkyl, lower alkoxy or lower alkylthio radicals or halogen or hydrogen atoms; and

X is a stabilizing anion; and

said ester is a compound of the formula:



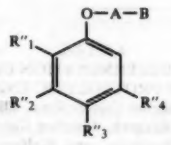
in which

R'_1, R'_2, R'_3 and R'_4, which may be the same or different, are hydrogen or halogen atoms or lower alkyl, lower alkoxy, aryl, aralkyl, aralkoxy, hydroxyl, carboxy, carboxy lower alkoxy, aralkoxycarbonyl, aralkoxycarbonyl lower alkoxy, nitro, alkylamino, dialkylamino or acylamino radicals or in which two adjacent substituents represent a fused benzene ring or a halogen-substituted fused benzene ring;

X' is a sulfur atom or an imino group optionally substituted by lower alkyl, aryl, aralkyl or acyl radical;

A is an acyl residue of an amino acid or of a peptide; and

B is a nitrogen protective group or derived therefrom or a compound of the formula



wherein

R''_1, R''_2, R''_3 and R''_4, which may be the same or different, are hydrogen atoms or lower alkyl, lower alkoxy, alkylamino or dialkylamino radicals or in which two adjacent substituents can also represent a fused benzene ring;

A is an acyl residue of an amino acid or of a peptide; and

B is a nitrogen protective group conventional in peptide chemistry or derived therefrom.

4,551,429

STIMULATION OF ANTIGEN PRODUCTION BY *BORDETELLA PERTUSSIS*

George Greenspan, Narberth, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 15, 1983, Ser. No. 532,642

Int. Cl.[4] C12N *1/38, 1/10, 1/00;* **A61K** *39/02, 39/10;* **C12P** *21/00, 21/02*

U.S. Cl. 435—68 **2 Claims**

1. In a method for preparing the protective antigenic hemagglutinin of *Bordetella pertussis,* consisting of fimbrial hemagglutinin and leucocytosis promoting factor hemagglutinin, which comprises propagating a *Bordetella pertussis* culture in an aqueous nutrient medium containing a source of carbohydrate, a source of organic nitrogen and inorganic salts, under submerged aerobic conditions with shaking of the culture medium, transferring an inoculum of the first stage growth of *Bordetella pertussis* into an aqueous nutrient medium containing sources of organic nitrogen, vitamins and inorganic salts, growing said inoculum in said medium under submerged aerobic conditions, with shaking, separating the *Bordetella pertussis* cells from the medium and recovering the protective antigenic hemagglutinin-containing supernatant, the improvement which comprises adding to the non-carbohydrate containing aqueous nutrient medium polyvinyl alcohol having a molecular weight ranging from about 1,500 to about 16,000 at the level of 0.5 to 2.0 g/l of medium, whereby substantially enhanced hemagglutinating activity is imparted thereto.

4,551,430

CONSTITUTIVE PRODUCER OF A THERMOSTABLE GLUCOSE ISOMERASE

Edmund W. Hafner, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 27, 1983, Ser. No. 546,132

Int. Cl.[4] C12P *19/24;* **C12N** *9/92, 1/20;* **C12R** *1/465*

U.S. Cl. 435—94 **6 Claims**

1. A biologically pure culture of a mutant of *Streptomyces thermoviolaceus* NRRL 15615 having the ability to produce a thermostable glucose isomerase as a constitutive enzyme when the mutant microorganisms are grown aerobically in a medium containing an assimilable source of carbon, nitrogen, and mineral nutrients at a temperature from about 20° to about 55° C.

4,551,431

THE USE OF GALLIUM AND INDIUM SALTS FOR THE IMMOBILIZATION OF PROTEINS

Phyllis J. Pierce, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1983, Ser. No. 487,362

Int. Cl.[4] C12N *11/14;* **A61K** *37/16, 37/48*

U.S. Cl. 435—176 **25 Claims**

1. A process for the production of a dried immobilized gel/protein composite, which comprises:

(A) substantially simultaneously admixing (a) an aqueous solution/dispersion of a physiologically and chemically active protein, (b) an aqueous solution of a Group IIIA metal salt selected from the group consisting of salts of gallium and indium, and (c) an alkaline solution, in proportions effective to coprecipitate said protein and said Group IIIA metal as a hydrous gel suspension, said gel suspension containing at least a substantial proportion of said protein,

(B) separating said hydrous gel/protein, and

(C) drying said hydrous gel/protein, thereby forming said dried immobilized gel/protein composite.

15. A dried immobilized protein composite comprising a dispersed physiologically and chemically active protein in a dry gel matrix of an oxide/hydroxide of gallium or of indium.

4,551,432

PARACOCCUS DENITRIFICANS, FUM-14: A FUMARASE OVERPRODUCER

Yoshihisa Tsuda, Wilmette, and Denise M. Jackson, Chicago, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 14, 1983, Ser. No. 551,646

Int. Cl.[4] C12N *9/88, 1/20;* **C12P** *7/42;* **C12R** *1/01*

U.S. Cl. 435—232 **1 Claim**

1. A method of producing fumarase comprising growing aerobically *Paracoccus denitrificans,* FUM-14, NRRL B-15710, in a medium containing an assimiliable source of carbon, nitrogen, and mineral nutrients at a temperature from about 20° to about 45° C., and recovering the fumarase produced thereby.

4,551,433

MICROBIAL HYBRID PROMOTERS

Herman A. DeBoer, Pacifica, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 264,306, May 18, 1981, abandoned, and a continuation-in-part of Ser. No. 328,174, Dec. 7, 1981, abandoned. This application Jan. 11, 1982, Ser. No. 338,397

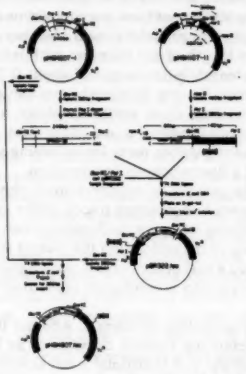
Int. Cl.[4] C12N *1/20, 15/00, 1/00;* **C12P** *21/00, 21/02, 21/04;* **C07H** *21/04;* **C12R** *1/19*

U.S. Cl. 435—253 **15 Claims**

8. A hybrid promoter/operator which comprises:

(a) an operator DNA sequence of a first promoter/operator which is capable of being derepressed by induction, and which comprises that sequence immediately downstream of a position between about −10 and −35 of said first promoter operator; and

(b) upstream from the sequence of (a), a DNA sequence which comprises that sequence of a second promoter



which is immediately upstream of a position between about −10 and −35 of said second promoter.

4,551,434

METHOD FOR RECOGNIZING STRUCTURAL INHOMOGENEITIES IN TITANIUM ALLOY TEST SAMPLES INCLUDING WELDED SAMPLES

Martin Thoma, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,253

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309448

Int. Cl.[4] G01N *1/32, 33/20*

U.S. Cl. 436—5 **6 Claims**

1. A method for visually inspecting a test specimen made of titanium alloy for grain or textural inhomogeneities in said test specimen made of titanium alloy, comprising the following steps:

(a) cleaning a specimen made of titanium alloy by a steam degreasing operation;

(b) blasting the cleaned surface of the specimen with aluminum oxide (Al_2O_3) particles having a mesh size of about 270;

(c) erosive etching of the specimen with a nitric acid (HNO_3)—hydrofluoric acid (HF) solution;

(d) washing or rinsing the specimen with water;

(e) grain or texture etching the test specimen with a solution including a mixture of chromic acid (CrO_3) and hydrofluoric acid (HF) wherein each of these acids includes hexafluosilicic acid (H_2SiF_6) as an additive A in the molar ratio range of $8 \geqq F/A \geqq 5$ with regard to fluorine and in the molar ratio range of $6 \geqq Cr/A \geqq 3$ with regard to chromium, and wherein the molar concentration range for said additive A is 0.1 to 2.0 mole per liter;

(f) washing or rinsing the specimen with water, whereby contrast between any grain or textural inhomogeneities and their background is substantially increased for said visual inspection, and

(g) then visually inspecting the specimen for any grain or textural inhomogeneities.

4,551,435

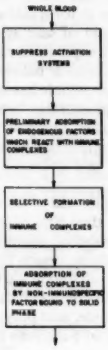
SELECTIVE REMOVAL OF IMMUNOSPECIFICALLY RECOGNIZABLE SUBSTANCES FROM SOLUTION

Paul A. Liberti, Churchville, Pa., and Paul Pollara, South Plainfield, N.J., assignors to Immunicon, Inc., Philadelphia, Pa.

Filed Aug. 24, 1983, Ser. No. 526,039

Int. Cl.[4] G01N *33/54;* **B01D** *27/00*

U.S. Cl. 436—541 **20 Claims**


WHOLE BLOOD
SUPPRESS ACTIVATION SYSTEMS
PRELIMINARY ADSORPTION OF ENDOGENOUS FACTORS WHICH REACT WITH IMMUNE COMPLEXES
SELECTIVE FORMATION OF IMMUNE COMPLEXES
ADSORPTION OF IMMUNE COMPLEXES BY NON-IMMUNOSPECIFIC FACTOR BOUND TO SOLID PHASE

1. A method for selectively removing from a solution any soluble or suspended immunospecifically recognizable substance, which method comprises the steps of:

a. determining the amount of said substance present in said solution;

b. adding to said solution an immunospecific component capable of reacting specifically with said substance, said component being added in a quantity appropriate to form immune complexes with the amount of said substance determined to be present in said solution, said immune complexes being capable of binding to non-immunospecific factor having an affinity therefor; and

c. contacting said solution with an adsorbent comprising non-immunospecific factor which exhibits an affinity for said immune complexes, whereby said immune complexes become bound to said non-immunospecific factor and said immunospecifically recognizable substance is substantially completely removed from said solution.

4,551,436

FABRICATION OF SMALL DENSE SILICON CARBIDE SPHERES

Curtis A. Johnson, Schenectady; Gary M. Renlund, Scotia; Charles E. Van Buren, Schenectady, and Svante Prochazka, Saratoga, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,033

Int. Cl.[4] C04C *35/56*

U.S. Cl. 501—90 **30 Claims**

1. A process for producing sintered spherical or nominally spherical particles of polycrystalline silicon carbide having a density greater than 80% of the theoretical density for silicon carbide and having a diameter ranging from about 5 microns to about 2000 microns which consists essentially of forming a slurry consisting essentially of sinterable silicon carbide powder and a liquid medium which has no significantly deleterious effect thereon, said sinterable silicon carbide powder having an average particle size which is submicron and which consists essentially of silicon carbide, a boron additive selected from the group consisting of boron and boron carbide in an amount equivalent to from about 0.3% by weight to about 3% by weight of boron based on said silicon carbide, and an amount of a carbonaceous additive equivalent to from about 0.1% by weight to about 5% by weight of free carbon based on said

silicon carbide, said carbonaceous additive being selected from the group consisting of a carbonaceous organic material which completely decomposes at a temperature ranging from 50° C. up to 450° C. to free carbon and gaseous product of decomposition, and mixtures thereof with free carbon, spray drying said slurry into spherical or nominally spherical agglomerates, at least a portion of said carbonaceous organic material being an agglomerate-forming binder in solution and/or suspension in said liquid medium in said slurry and being present in an amount at least sufficient to form said agglomerate and being at least about 1% by weight of said agglomerate, and sintering said agglomerates at a temperature ranging from about 1900° C. to about 2300° C. at about or below atmospheric pressure in a vacuum or atmosphere which has no significant deleterious effect thereon, said agglomerates being of a size which produces said sintered particles, said slurry being characterized as sprayable into droplets into a hot air spray dryer wherein said droplets are dried into said spherical or nominally spherical agglomerates.

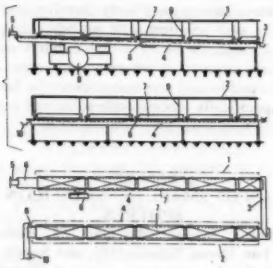
9. A polycrystalline spherical or nominally spherical particle having a density greater than 80% of the theoretical density for silicon carbide and consisting essentially of silicon carbide, from about 0.2 part to about 3 parts by weight of boron based on 100 parts by weight of silicon carbide, and up to about 5 parts by weight of free uncombined carbon based on 100 parts by weight of silicon carbide, said polycrystalline particle ranging in diameter from about 5 microns to about 10,000 microns.

4,551,437

PROCESS FOR THE TRANSPORTATION THROUGH AN ELONGATE CHAMBER AND ELECTROMAGNETIC RADIATION HEATING OF GRANULATED MATERIAL

Georges Berrebi, Valence, France, assignor to Eurecat-Europeene de Retraitement de Catalyseurs, La Voulte sur Phone, France

Filed Jan. 3, 1984, Ser. No. 567,722
Claims priority, application France, Mar. 15, 1983, 83 04350
Int. Cl.[4] B01J *23/96, 23/94, 23/92;* F27B *9/06*
U.S. Cl. 502—5 **8 Claims**



1. A process for reactivating or regenerating solid catalyst particles used for the treatment or conversion of hydrocarbons, the process comprising at least one step of heating the catalyst particles wherein said heating step is conducted by (a) continuously displacing said catalyst particles through at least one elongate chamber having its longitudinal axis inclined with respect to a horizontal line at an angle of about 0°–5°, said particles progressing from an inlet zone of said chamber to an outlet zone of said chamber over a plurality of floor plates stepped so that the particles can fall from an upstream plate to a downstream plate as the particles are displaced, the plates being inclined at an angle with respect to the axis of the elongate chamber of less than 15°, said movement being imparted to the particles by causing the elongate chamber to vibrate in a direction substantially parallel to the elongate direction of the chamber, by means of vibratory power, at an amplitude such that a translational movement is imparted to said catalyst particles over the length of said chamber, with a substantially uniform statistical distribution over the length of said chamber, and with a variable speed producing continuous mixing of the individual particles with the catalyst particles remaining substantially in contact with the floor plates and being displaced substantially by sliding without microprojection on said floor plate, (b) heating said particles in said chamber along substantially the entire length of the chamber with infrared radiation having a wavelength in the range of about 0.75 μm–1.5 mm wherein said particles are irradiated over the entire surfaces thereof as they drop from upstream plates to downstream plates, and (c) establishing a gas flow into said chamber through the bed of catalyst particles by having said floor plate constructed of a discontinuous construction.

2. A two-step process of reactivation or regeneration of a catalyst containing hydrocarbon traces, sulfur and carbon, the first step comprising stripping the hydrocarbons and removing at least a portion of the sulfur, and the second step comprising removing at least a part of the carbon, and characterized in that at least the second step is conducted according to the process of claim 1.

4. A process according to claim 2, wherein the first step is effected in a revolving furnace comprising an elongate, substantially cylindrical and horizontal zone, slowly revolving on its longitudinal axis, and wherein the catalyst particles are stirred by means of at least one gas, at a temperature of 170°–350° C., the gas being introduced all along the chamber through openings provided in the walls of said chamber.

4,551,438

OLIGOMERIZATION OF LIQUID OLEFIN OVER A NICKEL-CONTAINING SILICACEOUS CRYSTALLINE MOLECULAR SIEVE AND HYDROCARBYL ALUMINUM HALIDE

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 11, 1984, Ser. No. 598,772
Int. Cl.[4] B01J *29/28*
U.S. Cl. 502—62 **15 Claims**

1. A catalyst composition for promoting oligomerization of olefins, said composition comprising the components:

(a) a nickel-containing silicaceous crystalline molecular sieve in the hydrogen form selected from the group consisting of ZSM-5, ZSM-11, crystalline admixtures of ZSM-5 and ZSM-11, silicalite, an organic silicate disclosed in Ser. No. Re. 29,948 and CZM or mixtures thereof; and

(b) at least one hydrocarbyl aluminum halide; the molar ratio of the hydrocarbyl aluminum halide to the nickel being from 1:1 to 10:1.

2. The catalyst composition of claim 1 wherein the nickel-containing silicaceous crystalline molecular sieve also contains zinc cation.

3. The catalyst composition of claim 1 wherein said nickel-containing silicaceous crystalline molecular sieve is silicalite.

6. The catalyst composition of claim 1 wherein said nickel-containing silicaceous crystalline molecular sieve is ZSM-5.

4,551,439

SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION AND PROCESS FOR PRODUCING SAME

Masato Harada, Kisarazushi; Shinya Miya; Sadahiko Yamada, both of Ichiharashi, and Makoto Iijima, Ichiharashi, all of Japan, assignors to Chisso Corporation, Japan

Filed Feb. 11, 1985, Ser. No. 700,592
Claims priority, application Japan, Oct. 4, 1984, 59-208775
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—107 **5 Claims**

2. A process for producing a solid catalyst component for olefin polymerization, characterized by producing it via the reaction of the following steps I to III:

I. a step of mixing (a) an anhydrous magnesium dihalide, (b)

an orthotitanic acid ester expressed by the general formula $Ti(OR^1)_4$ and/or a polytitanic acid ester expressed by the general formula $R^2—O-Ti(OR^3)(OR^4)]_mO-R^5$ wherein R^1, R^2, R^3, R^4, and R^5 each represent an alkyl group having 1 to 20 carbon atoms, an aryl group having 1 to 20 carbon atoms or a cycloalkyl group having 3 to 20 carbon atoms and m represents a number of 2 to 20, and (c) a saturated or unsaturated, monohydric or polyhydric alcohol, in an inert hydrocarbon solvent and dissolving these materials therein, to obtain a component A;

II. a step of mixing and reacting said component A with a component B consisting of (d) an aliphatic or aromatic mono- or polycarboxylic acid ester having 2 to 24 carbon atoms (hereinafter referred to as organic acid ester), (e) an aluminum halide expressed by the general formula $AlX_nR^8_{3-n}$ wherein X is Cl or Br, R^8 represents an alkyl group having 1 to 20 carbon atoms, an aryl group having 1 to 20 carbon atoms or a cycloalkyl group having 3 to 20 carbon atoms and n represens a number of 0 to 3, and (f) a silicon halide expressed by the general formula $SiX_lR^6_{4-l}$ or $SiX_p(OR^7)_{4-p}$ wherein X represents Cl or Br, R^6 and R^7 each represent an alkyl group having 1 to 20 carbon atoms, an aryl group having 1 to 20 carbon atoms or a cycloalkyl group having 3 to 20 carbon atoms, and l and p each represent a number of 1 to 4, to deposit solids (hereinafter referred to as "solid product (I)"); and

III. reacting this solid product (I) with a component C consisting of (g) a titanium halide expressed by the general formula $TiX_q(OR^9)_{4-q}$ wherein X represents Cl or Br, R^9 represents an alkyl group having 1 to 20 carbon atoms, an aryl group having 1 to 20 carbon atoms or a cycloalkyl group having 3 to 20 carbon atoms and q represents a number of 1 to 4, and/or (h) a vanadyl halide or a vanadium halide expressed by the general formulas $VOX_s(OR^{10})_{3-s}$ or $VX_t(OR^{11})_{4-t}$ wherein X represents Cl or Br, R^{10} and R^{11} each represent an alkyl group having 1 to 20 carbon atoms, an aryl group having 1 to 20 carbon atoms or a cycloalkyl group having 3 to 20 carbon atoms, s represenis a number of 1 to 3, and t represents a number of 1 to 4, to obtain solids (hereinafter referred to as "solid product (II)").

3. A process according to claim 2 wherein said (a), (b) and (c) as raw materials constituting said component A are mixed in an inert hydrocarbon solvent with stirring or shaking at a temperature of 50° to 150° C., under a pressure of 0 to 5 Kg/cm^2G, for a time of 10 minutes to 5 hours and dissolved therein.

4,551,440

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masafumi Imai; Tadashi Yamamoto; Hiroyuki Furuhashi, and Hiroshi Ueno, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,463

Claims priority, application Japan, Aug. 30, 1983, 58-157094

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—119 **30 Claims**

1. A catalyst component for the polymerization of olefins obtained by (1) reacting (A) Mg(OR)(OR') with (B) a silicon compound having at least one silicon-hydrogen bond, (2) contacting the reaction product with (C) an electron donor compound, (3) contacting the product from step (2) with an organoaluminum compound, and (4) contacting the step (3) product with a titanium compound, wherein R and R' are radicals selected from alkyl, alkenyl, cycloalkyl, aryl and aralkyl radicals and R and R' may be the same or different.

6. The catalyst component of claim 1 wherein the silicon compound is trichlorosilane.

4,551,441

NICKEL BORIDE-POLYMER IN-OIL CATALYST

Cornelis Van Dijk, Zwijndrecht, and Rudolph O. De Jongh, The Hague, both of Netherlands, assignors to Internationale Octrooi Maatscappij "Octropa" B.V., Rotterdam, Netherlands

Filed Jul. 11, 1984, Ser. No. 629,967

Claims priority, application Netherlands, Jul. 20, 1983, 8302590

Int. Cl.[4] B01J *31/06*

U.S. Cl. 502—159 **10 Claims**

1. A finely divided nickel boride catalyst stabilized with a linear organic polymer, characterized in that nickel boride with a stabilizing linear organic polymer is suspended in a fatty compound.

4,551,442

CATALYST FOR UPGRADING SYNTHESIS GAS

Frederick A. Pesa, Aurora, and Anne M. Grahum, Northfield, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Division of Ser. No. 557,725, Dec. 2, 1983, Pat. No. 4,496,666, which is a continuation of Ser. No. 333,218, Dec. 21, 1981, abandoned. This application Sep. 24, 1984, Ser. No. 653,395

Int. Cl.[4] B01J *21/04, 21/08, 23/78*

U.S. Cl. 502—178 **8 Claims**

1. A catalyst for the upgrading of synthesis gas to alcohol products of the formula

$$A_aRuM_bO_x$$

wherein

A is an alkali metal

M is Pd, Pt or mixtures thereof, and

wherein

a is about 0.002 to about 2,

b is about 0.1 to about 10, and

x is the number of oxygens needed to fulfill the valence requirements of the other elements.

4,551,443

CATALYSTS FOR THE SELECTIVE HYDROGENATION OF ACETYLENES

Henry C. Hudson, New Caney, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 27, 1984, Ser. No. 675,175

Int. Cl.[4] B01J *21/04, 23/44, 23/64*

U.S. Cl. 502—313 **18 Claims**

1. A catalyst composition for the selective hydrogenation of acetylenic hydrocarbon impurities in olefinic hydrocarbon streams which comprises palladium and optionally chromium supported on a porous carrier which comprises alumina having a surface area less than about 5 m^2/g microns, a pore volume (Hg at 3000 psi) of between about 0.2 to about 0.5 cc/g and wherein greater than about 40% of the pore volume is contained in pores having pore diameters of greater than about 10 microns.

4,551,444

CATALYST FOR ALCOHOL SYNTHESIS

Fan-Nan Lin, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 584,374, Feb. 28, 1984,. This application Mar. 22, 1985, Ser. No. 714,735

Int. Cl.[3] B01J *23/72, 23/78, 23/84, 23/86*

U.S. Cl. 502—313 **6 Claims**

1. A catalyst composition suitable for the synthesis of alcohols from synthesis gas consisting of:

(a) at least one copper component,

(b) at least one iron group metal component,

(c) at least one metal component other than component (b) having a Periodic element number of 23 to 26,

(d) at least one alkali metal component, and

(e) promoting amount of about 0.1 to about 5 weight percent of at least one rhodium component which amount is a small effective amount sufficient to increase catalyst activity and catalyst life without significantly changing selectivity in comparison with the unpromoted catalyst.

4,551,445

DERIVATIVES OF ARGININE VASOPRESSIN ANTAGONISTS

Maurice Manning, Toledo, Ohio, and Wilbur H. Sawyer, Scarsdale, N.Y., assignors to The Medical College of Ohio, Toledo, Ohio and The Trustees of Columbia University, New York, N.Y.

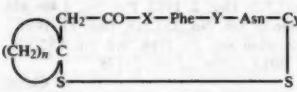
Filed Oct. 14, 1983, Ser. No. 541,979

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—9 **26 Claims**

1. A compound of the formula



wherein n is 4 or 5; X is D—Tyr(R), D—Phe, D—Val, D—Leu, D—Ile, D—Nva, D—Nle, D—Cha, D—Abu, D—Thr, D—Met, D—Asn or D—Gln; Y is Ile, Thr, Gln, Ala, Lys, Cha, Nva, Nle, Orn, Ser, Asn, Abu, Met or Leu; W is (D— or L—)Pro, Hy—Pro or Δ^3—Pro; Z is (D— or L—)Arg, Orn or Hys and R is methyl, ethyl, propyl or butyl.

4,551,446

USE OF SYNTHETIC PHOSPHOGLYCERIDES POSSESSING PLATELET ACTIVATING PROPERTIES AS DESENSITIZING AGENTS

Donald J. Hanahan, and R. Neal Pinckard, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 349,699, Feb. 18, 1982, Pat. No. 4,504,474, which is a division of Ser. No. 163,808, Jun. 27, 1980, Pat. No. 4,329,302. This application Dec. 27, 1982, Ser. No. 453,224

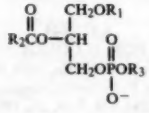
Int. Cl.[4] A61K *31/685, 31/66;* **C07F** *9/28*

U.S. Cl. 514—77 **2 Claims**

1. A method of therapeutic intervention to prevent systemic anaphylactic shock in a mammalian host susceptible to anaphylaxis upon challenge with an allergen, the method comprising:

determining that the host is susceptible to anaphylactic shock upon challenge with an allergen;

immediately prior to challenging the host with the allergen, administering to the host a sublethal, anti-anaphylactic effective amount of a compound represented by the formula:



wherein

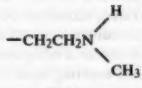
R_1 is a long chain carbon radical selected from the group consisting of $-(CH_2)_xCH_3$ and

and x denotes the integer 15 or 17;

R_2 is methyl or ethyl or if R_1 is $-(CH_2)_xCH_3$ then R_2 can be n-propyl; and

R_3 is an amine selected from the group consisting of

$-CH_2CH_2\overset{+}{N}(CH_3)_3$, $-CH_2CH_2N(CH_3)_2$,



and $-CH_2CH_2NH_2$, and

pharmaceutically acceptable salts thereof, and

allowing the host to be challenged with the allergen, thereby preventing the systemic anaphylactic shock normally caused by the allergen.

4,551,447

BETA-IMIDAZOLYL-ALPHA-(TRIFLUOROMETHYL-)ETHENYL PHOSPHATES AND INSECTICIDAL AND MITICIDAL USE

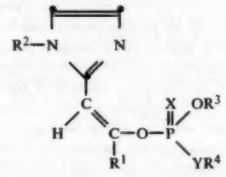
Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 24, 1985, Ser. No. 726,575

Int. Cl.[4] A01N *57/16;* **C07F** *9/65*

U.S. Cl. 514—94 **11 Claims**

1. A compound of the formula I



I

wherein R^1 is an alkyl group containing from 1 to 6 carbon atoms optionally substituted by one or more halogen atoms, a phenyl group optionally substituted by one or more halogen atoms or alkyl or alkoxy groups containing 1 to 2 carbon atoms each optionally substituted by one or more halogen atoms; R^2 is a hydrogen atom, or an alkyl group containing 1 to 4 carbon atoms; R^3 and R^4 each independently is an alkyl group containing 1 to 6 carbon atoms; and X and Y each independently is an oxygen or sulfur atom.

11. A method of combatting insect pests at a locus which comprises applying to the locus or the pests an insecticidally or miticidally effective amount of a compound according to claim 1.

4,551,448

FLUOROETHOXYPHENYL (DI)THIOPHOSPHATES, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR CONTROLLING PESTS

Walter Seufert, Speyer; Juergen Varwig, Heidelberg; Gerd Husslein, Ludwigshafen; Wolfgang Seppelt, Bobenheim-Roxheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

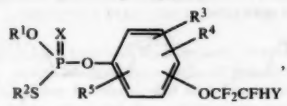
Filed Apr. 7, 1983, Ser. No. 482,775

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213152; Jul. 8, 1982, 3225507

Int. Cl.[4] A01N *57/14;* **C07F** *9/165*

U.S. Cl. 514—130 **4 Claims**

1. A fluoroethoxyphenyl(di)thiophosphate of the formula



(I)

where R^1 is ethyl, R^2 is alkyl of 3 or 4 carbon atoms, or ethoxyethyl R^3, R^4 and R^5 independently of one another are each hydrogen, chlorine or bromine, X is oxygen or sulfur, and Y is fluorine.

2. A process for combating pests, wherein a fluoroethoxyphenyl(di)thiophosphate of the formula I as claimed in claim 1 is allowed to act on the pests and/or their habitat.

4,551,449

AVOIDANCE OF THE IMMUNOSUPPRESSIVE AND ANTIPROLIFERATIVE EFFECTS OF LIPID EMULSIONS

Stephan Ladisch, Pacific Palisades, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 16, 1983, Ser. No. 552,489
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—182 **11 Claims**

1. The method which comprises the administration to humans on hyperalimentation of a lipid emulsion which contains a sterol, said sterol being present in an amount effective to substantially mitigate immunosuppressive and antiproliferative effects caused by conventional lipid emulsions in humans on hyperalimentation.

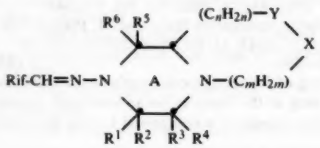
4,551,450

RIFAMYCIN HYDRAZONES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE

Peter Traxler, Schönenbuch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 27, 1984, Ser. No. 644,886
Int. Cl.[4] A61K *31/395;* C07D *519/00*
U.S. Cl. 514—183 **18 Claims**

1. A compound of the formula



(I)

in which p1 R^1, R^2, R^3, R^4, R^5 and R^6, independently of one another, each represents a hydrogen atom or C_{1-4}-alkyl,

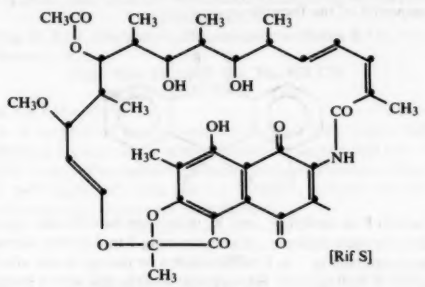
m and n, independently of one another, each represents an integer from 0 to 5,

X represents C_{1-5}-alkylidene, benzylidene or C_{1-4}-alkoxymethylene,

Y represents C_{1-5}-alkylidene, C_{1-4}-alkoxymethylene, oxy, thio or optionally substituted imino of the formula —N(R)— wherein R represents hydrogen, C_{1-4}-alkyl, C_{3-5}-alkenyl, C_{3-12}-cycloalkyl or phenyl, or

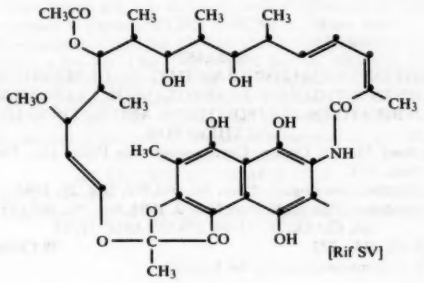
X and Y together represent 1,2-cycloalkylene or o-phenylene each of which can be substituted by from one to three C_{1-4}-alkyl radicals, and

Rif represents a radical of the partial formula



[Rif S]

or



[Rif SV]

and salts thereof.

18. A method for the treatment of infections in the human or animal body, characterised by the administration to the affected subject of an antimicrobially active dose of one of the compounds of of the formula I defined in claim 1, or a pharmacologically acceptable salt thereof, alone or together with a suitable carrier.

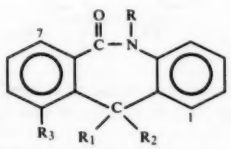
4,551,451

TRICYCLIC DERIVATIVES OF 5,6-DIHYDRO-11H-DIBENZO (B,E) AZEPIN-6-ONE HAVING PHARMACOLOGICAL ACTIVITY

Vittorio Pestellini; Mario Ghelardoni; Alessandro Giolitti; Giovanna Volterra, all of Florence; Martino Furio, Rome, and Alberto Meli, Florence, all of Italy, assignors to A. Menarini S.a.S., Italy

Continuation of Ser. No. 475,327, Mar. 14, 1983, abandoned.
This application Aug. 10, 1984, Ser. No. 639,687
Claims priority, application Italy, Mar. 15, 1982, 9356 A/82
Int. Cl.[4] A61K *31/53;* C07D *223/20*
U.S. Cl. 514—217 **18 Claims**

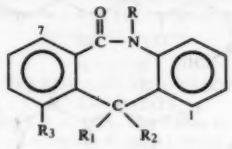
1. A compound of the formula:



in which R is hydrogen or alkyl containing 1 to 4 carbon atoms, R_1 and R_2 jointly represent an oxygen atom, and R_3 is NHCO-lower alkyl, NHCO-phenyl, NHCONH-lower alkyl or NHCONH-phenyl.

14. A pharmaceutical composition comprising as active

principle an anti-convulsant or sedative amount of at least one compound of the formula



in which R is methyl, R_1 and R_2 which can be different represent hydrogen, hydroxy, alkyl containing 1 to 8 carbon atoms, alkoxy containing 1 to 8 carbon atoms or phenyl lower alkyl, and R_3 is hydrogen, in proportional association with a corresponding pharmaceutical administration amount of a pharmaceutical carrier or excipient.

4,551,452

ANTI-INFLAMMATORY 2-METHYL-2H-1,2-BENZO-(OR -THIENO-)THIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

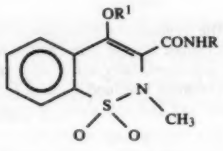
Anthony Marfat, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 563,902, Dec. 21, 1983, abandoned. This application May 2, 1984, Ser. No. 606,113

Int. Cl.[4] **C07D** *513/04, 279/02;* **A61K** *31/54*

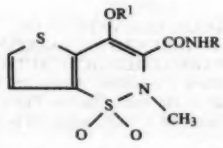
U.S. Cl. 514—222 **28 Claims**

1. A compound having the formula



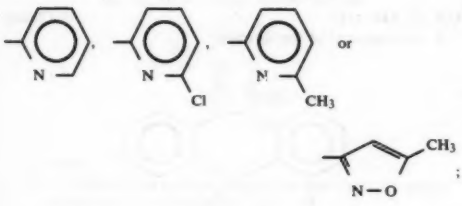
(I)

or

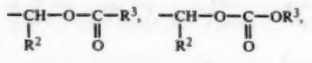


(II)

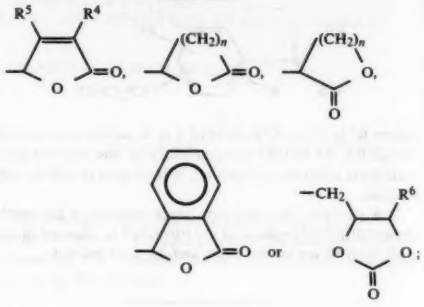
wherein R is



and R^1 is



-continued



n is 2, 3 or 4;

R^2 is hydrogen, methyl or phenyl;

R^4 and R^5 are each independently hydrogen or methyl;

R^3 is (C_1-C_{10})alkyl, (C_3-C_7)cycloalkyl, phenyl or benzyl, each optionally substituted by OR^6 or $OCOR^6$, and

R^6 is (C_1-C_3)alkyl.

4,551,453

2-(ω-ALKYLAMINOALKYL)- AND 2-(ω-DIALKYLAMINOALKYL-3-(4-X-BENZYLIDENE)-PHTHALIMIDINES

Antonio Marsili, Pedona di Camaiore, Italy, assignor to Laboratori Baldacci SpA, Pisa, Italy

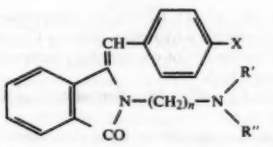
Filed Aug. 1, 1983, Ser. No. 518,848

Claims priority, application Italy, Jun. 8, 1982, 22759 A/82

Int. Cl.[4] **A61K** *31/40;* **C07D** *209/46, 411/06*

U.S. Cl. 514—234 **12 Claims**

1. A method of inducing local anesthesia in a patient comprising applying at the locus to be anesthetized a local anesthetic effective amount of a compound having the formula



(I)

wherein X and R′ are both hydrogen atoms and R″ is a methyl or ethyl group; or R′ and R′ are both methyl or ethyl groups, or R′ and R″ together with the nitrogen atom to which they are attached may be a morpholino group, and X represents OH, $OCOCH_3$, OCH_3, $OCOOC_2H_5$, NO_2 or NH_2; and n may be either 2 or 3; or the hydrochloride thereof.

4,551,454

3-(4-ALKOXYCARBONYLPIPERAZIN-1-YL)-SYDNONIMINES, A PROCESS FOR THEIR PREPARATION AND USE

Karl Schönafinger, Uehlfeld; Rudi Beyerle, Frankfurt am Main; Helmut Bohn; Melitta Just, both of Schoöneck; Piero A. Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Fed. Rep. of Germany

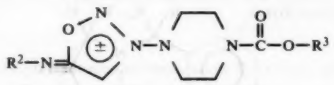
Division of Ser. No. 350,366, Feb. 19, 1982, Pat. No. 4,436,743. This application May 6, 1983, Ser. No. 477,146

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107933

Int. Cl.[4] C07D *413/04;* **A61K** *31/41*

U.S. Cl. 514—252 **25 Claims**

1. A pharmacologically-active compound which, in free-base state, is of the formula



wherein R^2 is —H or —CO—R^4;

R^3 is methyl, ethyl, propyl or isopropyl;

R^4 is aliphatic hydrocarbyl with from 1 to 4 carbon atoms and optionally substituted by alkoxy with from 1 to 3 carbon atoms, cycloaliphatic hydrocarbyl with from 5 to 7 ring carbon atoms, bicycloaliphatic hydrocarbyl with from 7 to 14 ring carbon atoms, tricycloaliphatic hydrocarbyl with from 7 to 16 ring carbon atoms, alkoxy with from 1 to 6 carbon atoms, carbocyclic aryloxy with from 6 to 12 ring carbon atoms, alkoxycarbonyl with from 2 to 7 carbon atoms, carbocyclic aryl with from 6 to 12 ring carbon atoms or such aryl with from 1 to 3 substituents each of which is a member selected from the group consisting of halo, alkyl with from 1 to 3 carbon atoms, alkoxy with from 1 to 3 carbon atoms and nitro, and at most 2 of which are nitro.

4,551,455

METHOD OF TREATING HIGH BLOOD PRESSURE USING 6-[4-(1-IMIDAZOLYL)-PHENYL]-5-METHYL-3-OXO-TETRAHYDROPYRIDAZINES

Gerd Hilboll, Cologne; Ille-Stephanie Doppelfeld, Bergheim-Giessen, and Gerrit Prop, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

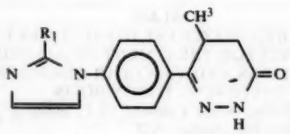
Filed Mar. 25, 1983, Ser. No. 478,993

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212304

Int. Cl.[4] C07D *237/06;* **A61K** *31/50*

U.S. Cl. 514—252 **3 Claims**

1. A method for the treatment of humans suffering from high blood pressure comprising administering a compound of general formula I,



I

wherein R_1 is a hydrogen atom or a methyl group, and their pharmaceutically compatible acid-addition salts with inorganic or organic acids, in a dosage between 0.1 and 500 mg one to three times daily.

4,551,456

OPHTHALMIC USE OF NORFLOXACIN AND RELATED ANTIBIOTICS

Irving M. Katz, Doylestown, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 14, 1983, Ser. No. 551,775

Int. Cl.[4] A61K *31/50, 31/495*

U.S. Cl. 514—254 **4 Claims**

1. A method of treating ocular bacterial infections which comprises topical ocular administration to an infected eye, of 0.015–1.5 mg of an antibiotic selected from norfloxacin, ofloxacin, pefloxacin, AT-2266 and Bayer 09867, hydrates or ophthalmologically acceptable salts thereof.

4,551,457

SUBSTITUTED THIAZOLO[3,2-A]PYRIMIDINES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate; Giuliana Arcari, and Ada Buttinoni, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

Continuation of Ser. No. 538,910, Oct. 4, 1983, abandoned, which is a division of Ser. No. 398,302, Jul. 14, 1982, Pat. No. 4,444,773. This application May 30, 1984, Ser. No. 615,346

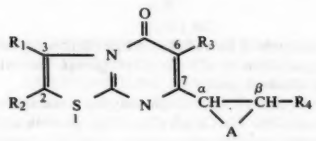
Claims priority, application United Kingdom, Jul. 15, 1981, 8121979; Jan. 20, 1982, 8201621; Apr. 29, 1982, 8212430

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.[4] C07D *513/04;* **A61K** *31/505*

U.S. Cl. 514—258 **9 Claims**

1. A compound having the following general formula (I)



(I)

wherein

A completes a bond, thereby providing a double bond between the α- and β-carbon atoms, or

A represents a —CH_2— group, thereby providing a cyclopropane ring including the α- and β-carbon atoms; each of R_1 and R_2 independently represents:

(a) a hydrogen or a halogen atom;

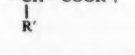
(b) C_1–C_4 alkyl, cyano or trifluoromethyl;

(c) thienyl, pyridyl, biphenyl or naphtyl;

(d) a phenyl group, unsubstituted or substituted by 1 to 3 substituents chosen from halogen, C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, formyloxy, C_2–C_8 alkanoyloxy, trifluoromethyl, nitro, amino, formylamino, C_2–C_8 alkanoylamino;

(e) a phenyl group substituted by one or two C_1–C_4 alkylenedioxy groups wherein the oxygen atoms are linked to two adjacent carbon atoms of the phenyl ring;

(f) a group



wherein each of R′ and R″ independently represents a hydrogen atom or a C_1–C_4 alkyl group;

R_3 represents:

(a′) a hydrogen or halogen atom;

(b′) C_1–C_4 alkyl;

(c′) hydroxy, formyloxy or C_2–C_8 alkanoyloxy;

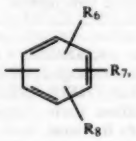
(d′) C_1–C_4 alkoxy or C_3–C_4 alkenyloxy;

R_4 represents:

(a″) a group

wherein R_5 represents a hydrogen atom or a C_1–C_4 alkyl group;

(b″) a group of formula



wherein each of R_6, R_7 and R_8 independently represents a hydrogen or a halogen atom; a hydroxy group; a C_1–C_6 alkoxy group unsubstituted or substituted by C_1–C_4 dialkylamino group; a C_1–C_4 alkyl group; formyloxy or a C_2–C_8 alkanoyloxy group; a $—NO_2$ group or a group

wherein each of R_9 and R_{10} independently represents a hydrogen atom, a C_1–C_4 alkyl group, formyl or a C_2–C_8 alkanoyl group;

(c″) a thiazolyl group, which may be unsubstituted or substituted by C_1–C_4 alkyl, or the pharmaceutically acceptable salts thereof.

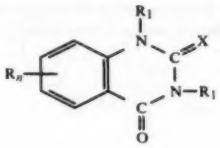
4,551,458

QUINAZOLINES AND FUNGICIDAL COMPOSITIONS THEREOF

Peretz Bracha, Omer, and Solomon Massil, Beer-Sheva, both of Israel, assignors to Makhteshim Chemical Works, Ltd., Beer Sheva, Israel

Filed Apr. 11, 1983, Ser. No. 483,938
Claims priority, application Israel, Apr. 11, 1982, 65464
Int. Cl.[4] A61K *31/505;* **C07D** *239/80*
U.S. Cl. 514—259 **13 Claims**

8. Fungicidal compositions comprising a solid or liquid diluent or carrier and a fungicidally effective amount of an active compound of the formula



wherein:

R is lower alkyl, halogen or nitro;

R_1 is selected from a haloalkylthio group containing 1 or 2 carbon atoms and at least two halogen substituents; lower alkyl, phenyl, halophenyl, and halo-lower alkyl-phenyl, provided that at least one of R_1 is a haloalkylthio group as defined;

n is zero or an integer of from 1 to 4; and

X is oxygen or sulfur.

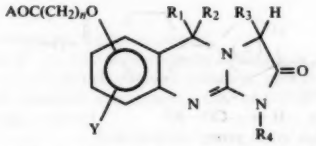
4,551,459

METHOD OF TREATING HEART FAILURE USING (2-OXO-1,2,3,5-TETRAHYDROIMIDAZO-[2,1-B]QUINAZOLINYL)OXYALKYLAMIDES

Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco; Robert Alvarez, Menlo Park, and John J. Bruno, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 467,125, Feb. 16, 1983, Pat. No. 4,490,371. This application Apr. 13, 1984, Ser. No. 599,858
Int. Cl.[4] A61K *31/505, 27/00*
U.S. Cl. 514—267 **6 Claims**

1. A method of treating heart failure by stimulating suppressed heart activity which occurs during heart failure which method comprises administering a therapeutically effective amount of a compound of formula I alone or in admixture with a pharmaceutically acceptable excipient wherein formula I is



(I)

and the pharmaceutically acceptable acid addition salts thereof wherein

n is an integer of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbon;

R_2 is hydrogen or R_1 and R_2 combined are oxo;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl, hydroxy lower alkyl and its acylates, carbamoyl alkyl, or carboxyalkyl;

R_4 is hydrogen, alkyl of 1 to 6 carbons, benzyl, or hydroxy lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy;

A is an amide forming group wherein the nitrogen substituents are: hydrogen; alkyl of 1 to 6 carbon atoms; hydroxyalkyl of 1 to 6 carbon atoms and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 12 carbon atoms; cycloalkyl of 3 to 8 carbon atoms or cycloalkyl lower alkyl of 4 to 12 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, —OH, —$OCOR_5$, halo, $—NH_2$, $—N(R_5)_2$, —$NHCOR_5$, —COOH, or —$COO(R_5)$ group wherein R_5 is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy groups or an $—NH_2$, $—N(R_5)_2$, —$NHCOR_5$, —COOH, or —$COOR_5$ group wherein R_5 is lower alkyl; morpholinyl; piperidinyl; perhexylenyl; N-loweralkylpiperazinyl; pyrrolidinyl; tetrahydroquinolinyl; tetrahydroisoquinolinyl; (±)-decahydroquinolinyl or indolinyl and the pharmaceutically acceptable salts thereof.

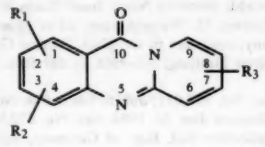
4,551,460

PYRIDO[2,1-B]QUINAZOLINE DERIVATIVES USEFUL AS AGENTS FOR TREATMENT OF ALLERGIC CONDITIONS AND VASCULAR DISORDERS INVOLVING THROMBOSIS

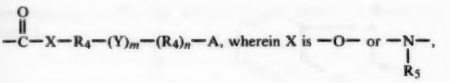
Jefferson W. Tilley, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 376,324, May 10, 1982, abandoned. This application Mar. 2, 1983, Ser. No. 471,382
Int. Cl.[4] A61K *31/505;* **C07D** *471/04*
U.S. Cl. 514—267 **58 Claims**

1. A compound of the formula

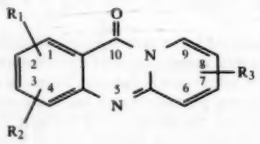


wherein R_1 and R_2, independently, are hydrogen, lower alkyl, lower alkoxy, hydroxy or halogen, and R_3 is in the 6-, 7- or 8-ring position and is

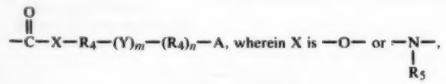


wherein R_5 is hydrogen or lower alkyl, R_4 is lower alkylene, Y is —O— or —S—, m is zero or 1, n is zero or 1, and A is an unsubstituted or substituted aromatic 5- or 6-membered heterocyclic group selected from the group consisting of pyridyl, pyrimidinyl, imidazolyl, furyl, thienyl thiazolyl, oxazolyl, isoxazolyl, pyrazinyl, quinolinyl, isoquinolinyl, quinazolinyl, 1,2,4-triazinyl, 1,2,4-triazolyl, benzimidazolyl and pyridazinyl and wherein the substituents are selected from the group consisting of straight- and branched-chain lower alkyl, straight- and branched-chain lower alkoxy, halogen and nitro, provided that when A is linked through a heterocyclic nitrogen, m and n must each be zero, or a pharmaceutically acceptable acid addition salt thereof.

27. A pharmaceutical composition comprising a compound of the formula



wherein R_1 and R_2, independently, are hydrogen, lower alkyl, lower alkoxy, hydroxy or halogen, and R_3 is in the 6-, 7- or 8-ring position and is



wherein R_5 is hydrogen or lower alkyl, R_4 is lower alkylene, Y is —O— or —S—, m is zero or 1, n is zero or 1, and A is an unsubstituted or substituted aromatic 5- or 6-membered heterocyclic group selected from the group consisting of pyridyl, pyrimidinyl, imidazolyl, furyl, thienyl thiazolyl, oxazolyl, isoxazolyl, pyrazinyl, quinolinyl, isoquinolinyl, quinazolinyl, 1,2,4-triazinyl, 1,2,4-triazolyl, benzimidazolyl and pyridazinyl and wherein the substituents are selected from the group consisting of straight- and branched-chain lower alkyl, straight- and branched-chain lower alkoxy, halogen and nitro, provided that when A is linked through a heterocyclic nitrogen, m and n must each be zero, or a pharmaceutically acceptable acid addition salt thereof, and an inert pharmaceutical carrier material.

4,551,461

SOFT CONTACT LENS AMBIENT TEMPERATURE DISINFECTANT AND RINSING SOLUTION AND METHOD

Guy J. Sherman, Mandeville, La., assignor to Sherman Laboratories, Inc., Abita Springs, La.

Continuation-in-part of Ser. No. 537,245, Sep. 28, 1983, Pat. No. 4,529,535, which is a continuation-in-part of Ser. No. 384,110, Jun. 1, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,088

Int. Cl.[4] A01N *43/54;* **A61K** *31/505*

U.S. Cl. 514—275 **16 Claims**

1. A method of treating a contact lens to kill bacteria associated therewith comprising:

(a) placing the lens in contact with an aqueous composition, said composition comprising water, trimethoprim and benzyl alcohol present together in an effective amount to kill bacteria; and

(b) maintaining the lens in contact with said aqueous composition for a time sufficient to kill bacteria.

8. An aqueous composition for ambient temperature disinfection of soft contact lenses comprising trimethoprim and benzyl alcohol present together in an effective amount to kill bacteria, said composition being compatible with soft contact lenses.

4,551,462

EBURNANE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Csaba Szántay; Lajos Szabó; György Kalaus; János Sápi; Éva Pálosi; Béla Kiss; Elemér Ezer, and György Hajós, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

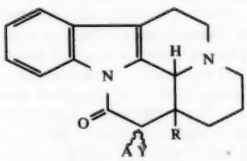
Filed Jun. 27, 1983, Ser. No. 508,438

Claims priority, application Hungary, Jun. 30, 1982, 2132/82

Int. Cl.[4] A61K *31/435;* **C07D** *461/00*

U.S. Cl. 514—283 **7 Claims**

1. A compound of the Formula (I)



(I)

wherein

R is ethyl,

A is hydroxyl, and

Y is hydrogen, or

A and Y together form an oxo group,

or a pharmaceutically acceptable acid addition salt thereof.

6. An antidepressant method of treatment which comprises the step of administering to a subject in need of said treatment a pharmaceutically effective amount of the compound of the Formula (I) defined in claim **1** or a pharmaceutically acceptable acid addition salt thereof.

7. An anticonvulsive method of treatment which comprises the step of administering to a subject in need of said treatment a pharmaceutically effective amount of the compound of the Formula (I) defined in claim **1** or a pharmaceutically acceptable acid addition salt thereof.

4,551,463

COMPOSITION CONTAINING 1-PHENYL-1,8-NAPHTHRIDIN-2(1H)-ONES AND A NON-STEROIDAL ANTI-INFLAMMATORY DRUG

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 438,681, Nov. 3, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,673

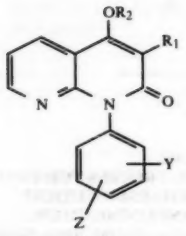
Int. Cl.[4] A61K *31/435*

U.S. Cl. 514—300 **10 Claims**

1. A composition for inhibiting the formation of a non-steroidal anti-inflammatory drug-induced ulceration which comprises;

(a) a non-steroidal anti-inflammatory drug;

(b) a compound having the structural formula I:



I

wherein

Y is hydrogen, hydroxy, benzyloxy, amino, sulfamyl, halogen, nitro, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms, alkyl-$S(O)_m$— having from 1 to 6 carbon atoms wherein m is 0, 1, or 2, trifluoromethyl, trifluromethylthio, or COOA wherein A is hydrogen, alkyl having from 1 to 6 carbon atoms or a cation derived from a pharmaceutically acceptable metal or an amine;

Z is hydrogen, hydroxy, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, or carboxylic acyloxy having from 2 to 6 carbon atoms;

R_1 is alkenyl having from 2 to 10 carbon atoms, alkynyl having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms, cycloalkenyl having from 5 to 8 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms or alkyl having from 1 to 10 carbon atoms which may be substituted with hydroxy, COOH, halogen, alkoxy having from 1 to 6 carbon atoms, phenyl, carboxylic acyl having from 2 to 6 carbon atoms, cycloalky having from 3 to 7 carbon atoms or carboxylic acyloxy having from 1 to 6 carbon atoms;

R_2 is hydrogen, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, carboxylic acyl having from 1 to 6 carbon atoms, alkyl having from 1 to 6 carbon atoms, $R_aR_bN(CH_2)_n$— (wherein R_a and R_b are hydrogen, alkyl having from 1 to 6 carbon atoms, and n is an integer of from 2 to 6) hydroxyalkyl having from 2 to 6 carbon atoms, dihydroxyalkyl having from 2 to 6 carbon atoms, hydroxyalkoxyalkyl having from 2 to 8 carbon atoms, or a cation derived from a pharmaceutically acceptable metal or an amine;

(c) and a pharmaceutical carrier.

4,551,464

ANTITHROMBOTIC SULFOXIMINO CARBOSTYRILS

Erich Müller; Josef Nickl; Berthold Narr; Josef Roch; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

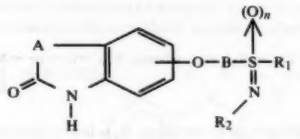
Continuation of Ser. No. 395,631, Jul. 6, 1982, Pat. No. 4,442,111. This application Jan. 26, 1984, Ser. No. 573,964

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129444; Oct. 29, 1981, 3142904

Int. Cl.[4] A61K *31/47;* **C07D** *215/22*

U.S. Cl. 514—312 **7 Claims**

1. A compound of the formula



wherein

n is 0 or 1;

A is vinylene or ethylene;

B is straight alkylene of 3 to 5 carbon atoms;

R_1 is alkyl of 1 to 6 carbon atoms; benzyl; phenylethyl; cyclohexyl; naphthyl; methoxy-naphthyl; α-, β- or γ-pyridyl; phenyl; 3- or 4-monosubstituted phenyl, where the substituent is alkyl of 3 or 4 carbon atoms, cyclohexyl, phenyl or fluorophenyl; monosubstituted phenyl, where the substituent is methyl, ethyl, methoxy, fluorine, chlorine or bromine; 3,4- or 3,5-disubstituted phenyl, where the substituents are each independently alkyl of 1 to 4 carbon atoms, methoxy, chlorine or bromine; 3,5-disubstituted 4-aminophenyl, 4-hydroxyphenyl or 4-methoxyphenyl, where the substituents are each independently chlorine, bromine, methoxy or alkyl of 1 to 4 carbon atoms; and

R_2 is hydrogen alkanoyl of 1 to 8 carbon atoms; methoxy(alkanoyl of 1 to 8 carbon atoms); benzoyl; monosubstituted benzoyl, where the substituent is halogen, cyano or alkyl of 1 to 4 carbon atoms; phenylsulfonyl; (monosubstituted phenyl)sulfonyl, where the substituent is halogen, cyano or alkyl of 1 to 4 carbon atoms; (alkoxy of 1 to 3 carbon atoms)carbonyl; aminocarbonyl; (chlorophenylamino)-carbonyl; methylamino-carbonyl; dimethylamino-carbonyl; naphthoyl; pinanoyl; camphorsulfonyl; (pentamethylphenyl)sulfonyl; 3-pyridinoyl; or 2-thenoyl;

or a non-toxic, pharmacologically acceptable addition salt thereof formed with a strong acid.

4,551,465

PIPERIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Edit Toth; Jozsef Torley; Eva Palosi; Szabolcs Szeberenyi; Laszlo Szporny; Sandor Gorog, and Istvan Hajdu, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

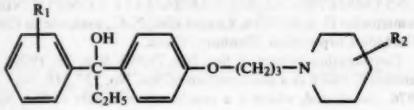
Filed Dec. 27, 1983, Ser. No. 565,902

Claims priority, application Hungary, Dec. 28, 1982, 4185

Int. Cl.[4] C07D *295/08;* **A61K** *31/445*

U.S. Cl. 514—317 **6 Claims**

1. A compound of the Formula (I)



wherein

R_1 is halogen, trihalomethyl, C_1–C_4 alkyl, or C_1–C_4 alkoxy; and

R_2 is hydrogen or C_1–C_4alkyl, or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

5. A method of inhibiting the liver microsomal monooxygenase enzyme system in a susceptible subject which comprises administering an effective amount of a compound as defined in claim 1.

4,551,466

PYRIDYL-2-OXY-PROPYL-1H-1,2,4-TRIAZOLE-3,5-DIAMINES

David G. Cooper, Letchworth, and George S. Sach, Welwyn, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

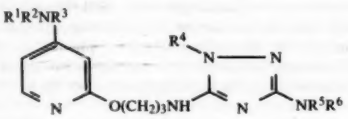
Filed Mar. 9, 1983, Ser. No. 473,519

Claims priority, application United Kingdom, Mar. 17, 1982, 8207835; Mar. 31, 1982, 8209540

Int. Cl.⁴ C07D *401/12, 401/14;* **A61K** *31/445*

U.S. Cl. 514—318 **12 Claims**

1. A compound of formula (1):



or a pharmaceutically acceptable salt thereof, where

R^1 and R^2 are the same or different and are C_{1-6} alkyl or with the nitrogen atom to which they are attached form a pyrrolidino or piperidino group;

R^3 is methylene;

R^4 is hydrogen, C_{1-6} alkyl, hydroxy-C_{2-4} alkyl; optionally substituted phenyl or phenyl (C_{1-6} alkyl) (the substituents being one or more C_{1-6} alkyl, or C_{1-6} alkoxy groups or halogen atoms);

R^5 and R^6 are hydrogen.

4,551,467

VASODILATING CYANOALKYL ESTERS OF 1,4-DIHYDROPYRIDINES

Egbert Wehinger, Velbert; Friedrich Bossert, Wuppertal; Wulf Vater, Leverkusen, and Kurt Stoepel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

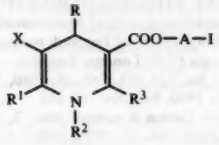
Filed Oct. 11, 1979, Ser. No. 83,884

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847236

Int. Cl.⁴ C07D *211/90, 401/04;* **A61K** *31/455*

U.S. Cl. 514—334 **16 Claims**

1. A compound of the formula I



(I)

or a salt thereof in which

R denotes a phenyl radical which is optionally substituted by one or two substituents selected from trifluoromethyl, nitro, halogen and cyano, or denotes a pyridyl radical,

R^1 and R^3 are identical or different and denote an alkyl group with 1 to 4 carbon atoms,

R^2 denotes a hydrogen atom or an alkyl group with 1 to 4 carbon atoms,

A denotes a straight-chain or branched alkylene group with up to 4 carbon atoms,

Y denotes a nitrile group and

X denotes the group —$COOR^7$, in which

R^7 denotes a straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical with up to 6 carbon atoms which is optionally interrupted in the chain by an oxygen atom and which is optionally substituted by trifluoromethyl.

7. A pharmaceutical composition containing as an active ingredient an effective vasodilating influencing amount of a compound according to claim 1 in admixture with a solid, liquid or liquefied gaseous diluent.

4,551,468

HETEROCYCLIC THROMBOXANE SYNTHETASE INHIBITORS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Peter E. Cross, Canterbury; Roger P. Dickinson, Dover, and Geoffrey N. Thomas, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

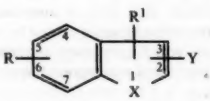
Division of Ser. No. 313,121, Oct. 20, 1981, Pat. No. 4,410,539. This application Aug. 22, 1983, Ser. No. 525,362

Claims priority, application United Kingdom, Oct. 23, 1980, 8034198

Int. Cl.⁴ A61K *31/38;* **C07D** *333/70*

U.S. Cl. 514—339 **10 Claims**

1. A compound of the formula:



(I)

wherein

R^1, which is attached to the 2-, 3- or 4-position, is hydrogen, halogen, C_1–C_4 alkyl, hydroxy, or C_1–C_4 alkoxy;

Y, which is attached to the 2- or 3-position, is —COOH, —COO(C_1–C_4 alkyl) or —$CONH_2$;

X is O, S, NH, N (C_1–C_4) alkyl or N(benzyl); and

R, which is attached to the 5-, 6- or 7-position, is (3- or 4-pyridyl)-Z^2— wherein

Z^2 is —CH_2—, —CH_2CH_2—, —CH=CH—, —CH_2O— or —OCH_2—; and the pharmaceutically acceptable salts thereof.

10. A method for treating a human being having a condition characterized by an imbalance of the prostacyclin:thromboxane A_2 ratio which comprises administering to said human a sufficient amount of a compound according to claim 1 to restore the prostacyclin:thromboxane A_2 balance in said human.

4,551,469

ANTIFUNGAL TRIAZOLE ETHANOL DERIVATIVES

Keith P. Parry; Paul A. Worthington, both of Maidenhead, and William G. Rathmell, Wokingham, all of England, assignors to Imperial Chemical Industries PLC, London, England

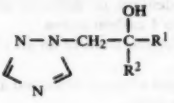
Continuation-in-part of Ser. No. 124,253, Feb. 25, 1980,. This application Sep. 3, 1980, Ser. No. 183,410

Claims priority, application United Kingdom, Mar. 7, 1979, 7908003; Sep. 21, 1979, 7932819; Feb. 15, 1980, 8005141; Aug. 18, 1980, 8026884

Int. Cl.[4] **A01N** *43/64, 59/20;* **C07D** *249/08, 413/10*

U.S. Cl. 514—383 **6 Claims**

1. A compound of general formula (I)



wherein R^1 is cycloalkyl of up to 6 carbon atoms, or halophenyl, and R^2 is halophenyl or an acid addition salt of copper, zinc, manganese or iron complex thereof.

5. A fungicidal composition consisting essentially of a fungicidally effective amount of a compound, salt or complex as claimed in claim **1**, and a carrier or diluent.

4,551,470

HEXAHYDRO-3,5-DIOXO-1H-PYRROLIZINE-2-CARBOXYLIC ACID AND DERIVATIVES, AND USE FOR REVERSING ELECTROCONVULSIVE SHOCK AMNESIA

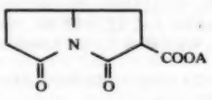
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 29, 1983, Ser. No. 527,718

Int. Cl.[4] **A61K** *31/40;* **C07D** *487/06*

U.S. Cl. 514—413 **16 Claims**

1. A compound having the formula



where A is hydrogen, methyl, alkyl of from three to six carbon atoms, phenyl, $-(CH_2)_{1-4}$phenyl, sodium, potassium, magnesium, calcium, aluminum, zinc, iron, or ammonium.

15. A method of reversing amnesia caused by electroconvulsive shock in humans which comprises administering to said human an effective amount of a compound in accordance with claim **1**.

4,551,471

USE OF 3-INDOLEPYRUVIC ACID FOR INCREASING SEROTONIN

Giovanna De Luca; Giovanni Di Stazio; Vincenzo Politi, and Mario Materazzi, all of Rome, Italy, assignors to Polifarma S.p.A., Rome, Italy

Filed Oct. 7, 1983, Ser. No. 540,051

Claims priority, application Italy, Oct. 11, 1982, 49251 A/82

Int. Cl.[4] **A61K** *31/405;* **C07D** *209/20*

U.S. Cl. 514—419 **4 Claims**

2. A method for increasing brain serotonin levels in mammals comprising administering orally a therapeutically effective amount of 3-indolpyruvic acid or a pharmaceutically acceptable salt thereof.

4,551,472

UNSYMMETRICAL BIS-CARBAMATE COMPOUNDS

Themistocles D. J. D'Silva, Chapel Hill, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

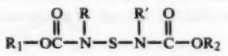
Continuation-in-part of Ser. No. 79,893, Sep. 28, 1979, abandoned, which is a continuation of Ser. No. 737,218, Nov. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 636,630, Dec. 1, 1975, abandoned. This application Jan. 9, 1984, Ser. No. 569,202

The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.[4] **A01N** *47/12, 47/22;* **C07C** *161/00*

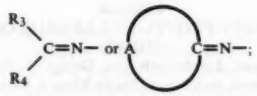
U.S. Cl. 514—477 **31 Claims**

1. A compound of the formula:



wherein: R and R′ are individually alkyl radicals having from 1 to 4 carbon atoms;

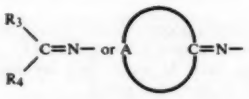
R_1 is



or

R_1 is alkynyl when R_2 is other than alkenyl or alkynyl;

R_2 is other than R_1 and is alkenyl, alkynyl, phenyl, benzofuranyl, benzothienyl, naphthyl or tetrahydronaphthyl all of which may be either unsubstituted or substituted with one or more halogen, nitro, nitrile, alkyl, alkylthio, alkylthioalkyl, methylenedioxy, amino, alkylamino, dialkylamino, alkoxycarbonylamino, dialkylamino-alkyleneimino, alkylcarbonylamino, formylamino, dicyanoethylidene, alkoxy, alkynyloxy, phenoxy, phenyl, 2-dithianyl, 2-dithiolanyl, 2-dioxalanyl, 2-oxathianyl, 2-oxathiolanyl or 2-dioxanyl groups in any combination; or R_2 is:

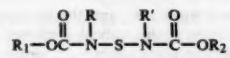


R_3 is hydrogen, alkyl, alkylthio or cyano;

R_4 is alkyl, alkylthio, alkylthioalkyl, alkoxy, aroyl, alkanoyl or alkoxycarbonyl, all of which may be unsubstituted or aliphatically substituted in any combination with one or more cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl groups or R_4 is phenyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl or an R_5CONH- or $R_5CON(alkyl)$-group where R_5 is hydrogen, alkyl or alkoxy; and

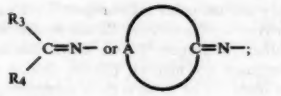
A is a divalent aliphatic chain, completing a five or six member ring, which includes one or two divalent oxygen, sulfur, sulfinyl or sulfonyl groups and which may also include one divalent amino alkylamino or carbonyl group; in any combination or A may also complete a six membered ring which includes three divalent sulfur, sulfinyl or sulfonyl groups in any combination; provided that the total number of aliphatic carbon atoms in R_3, R_4 and A, individually, may not exceed eight and provided that R_2 may not be 4-oximino-1,3-dithiolanyl.

24. A method of controlling insects, mites and nematodes which comprises subjecting them to an insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein: R and R' are individually alkyl radicals having from 1 to 4 carbon atoms;

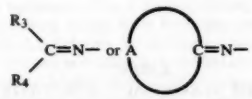
R_1 is



or

R_1 is alkynyl when R_2 is other than alkenyl or alkynyl;

R_2 is other than R_1 and is alkenyl, alkynyl, phenyl, benzofuranyl, benzothienyl, naphthyl or tetrahydronaphthyl all of which may be either unsubstituted or substituted with one or more halogen, nitro, nitrile, alkyl, alkylthio, alkylthioalkyl, methylenedioxy, amino, alkylamino, dialkylamino, alkoxycarbonylamino, dialkylamino-alkyleneimino, alkylcarbonylamino, formylamino, dicyanoethylidene, alkoxy, alkynyloxy, phenoxy, phenyl, 2-dithianyl, 2-dithiolanyl, 2-dioxalanyl, 2-oxathianyl, 2-oxathiolanyl or 2-dioxanyl groups in any combination; or R_2 is:



R_3 is hydrogen, alkyl, alkylthio or cyano;

R_4 is alkyl, alkylthio, alkylthioalkyl, alkoxy, aroyl, alkanoyl or alkoxycarbonyl, all of which may be unsubstituted or aliphatically substituted in any combination with one or more cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl groups or R_4 is phenyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl or an R_5CONH- or $R_5CON(alkyl)$-group where R_5 is hydrogen, alkyl or alkoxy; and

A is a divalent aliphatic chain, completing a five or six member ring, which includes one or two divalent oxygen, sulfur, sulfinyl or sulfonyl groups and which may also include one divalent amino alkylamino or carbonyl group; in any combination or A may also complete a six membered ring which includes three divalent sulfur, sulfinyl or sulfonyl groups in any combination; provided that the total number of aliphatic carbon atoms in R_3, R_4 and A, individually, may not exceed eight and provided that R_2 may not be 4-oximino-1,3-dithiolanyl.

4,551,473

METHOD OF INHIBITING SNORING AND OBSTRUCTIVE SLEEP APNEA

George W. Schossow, 2316 Lilac La., White Bear Lake, Minn. 55110

Filed Apr. 26, 1984, Ser. No. 603,967
Int. Cl.[4] A61K *31/44, 31/135, 31/195*
U.S. Cl. 514—305 **3 Claims**

3. A method of inhibiting or preventing snoring and associated abstructive sleep apnea comprising administering to a person displaying such symptoms an effective amount of muscle relaxant acting at the spinal or supra-spinal level and selected from the class consisting of orphenadrine, orphenadrine citrate, 4-amino-3(p-chlorophenyl butyric acid), quinine sulfate and 5-chloro benzoxazolinone.

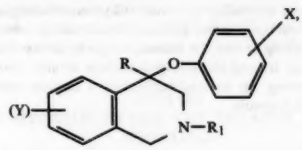
4,551,474

METHODS OF ALLEVIATING CONVULSIONS AND PAIN EMPLOYING 4-ARYLOXY-1,2,3,4 TETRAHYDROISOQUINOLINES

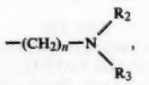
Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Joseph T. Klein, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 451,139, Dec. 20, 1982, Pat. No. 4,477,670, which is a division of Ser. No. 235,801, Feb. 19, 1981, Pat. No. 4,375,471. This application Aug. 9, 1984, Ser. No. 639,057
Int. Cl.[4] A61K *31/47;* **C07D** *217/24, 401/06*
U.S. Cl. 514—309 **2 Claims**

1. A method of alleviating convulsions in a mammal which comprises administering to a mammal an anticonvulsant effective amount of a compound having the formula



where Y is hydrogen and alkoxy of 1 to 6 carbon atoms; X is hydrogen, cyano, benzoyl, trifluoromethyl, phenyl, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms and nitro; R is hydrogen and alkyl of 1 to 6 carbon atoms; R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, aralkyl where the alkyl moiety has 1 to 6 carbon atoms and



where R_2 and R_3 are the same of different and are hydrogen and alkyl of 1 to 6 carbon atoms or R_2 and R_3 are fused together to form a pyrrolidino or a piperidino ring substituent; m is an integer of 1 or 2; n is an integer of 2 or 3 and a pharmaceutically acceptable acid addition salt thereof.

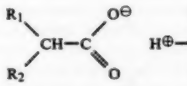
4,551,475

PHARMACEUTICAL PREPARATIONS FOR TOPICAL APPLICATION WHICH CONTAIN SALTS OF ALKANECARBOXYLIC ACIDS

Theodor Eckert, Münster, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

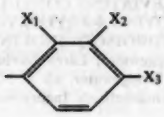
Division of Ser. No. 236,097, Feb. 20, 1981, Pat. No. 4,407,824. This application Jul. 27, 1983, Ser. No. 517,606
Int. Cl.[4] A61K *31/36, 31/40*
U.S. Cl. 514—408 **10 Claims**

1. A pharmaceutical preparation for topical application which contains an antiinflammatory and analgesically effective amount of a compound of the formula

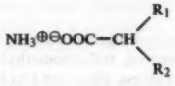


(I)

wherein R_1 is a group of the formula


(IIa)

wherein X_1 is hydrogen, X_2 is chlorine, and X_3 is 3-pyrrolin-1-yl, and R_2 methyl, or X_2 and X_3 are hydrogen and X_1 is 2,6-dichloroanilino, and R_2 is hydrogen, and each of R_3, R_4 and R_5 independently is lower alkyl containing up to and including 4 carbon atoms, or hydroxy-lower alkyl containing up to and including 4 carbon atoms, hydroxy-lower alkyl containing up to and including 4 carbon atoms to or one of the others is lower alkyl containing up to and including 4 carbon atoms, and the third is oligo-hydroxy-lower alkyl, or two of R_3, R_4 and R_5 are hydrogen and the other is lower alkyl containing up to and including 4 carbon atoms, hydroxy-lower alkyl containing up to and including 4 carbon atoms, oligo-hydroxy-lower alkyl containing up to and including 4 carbon atoms, amino-lower alkyl containing up to and including 4 carbon atoms, or a group of the formula



wherein alk is lower alkylene containing up to and including 4 carbon atoms, together with pharmaceutically acceptable carriers and excipients.

4,551,476

13,14-DIDEHYDRO-PROSTAGLANDINS AND PROCESS FOR THEIR PREPARATION

Franco Faustini, Milan; Carlo Passarotti, Gallarate; Roberto Ceserani, and Carmelo Gandolfi, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

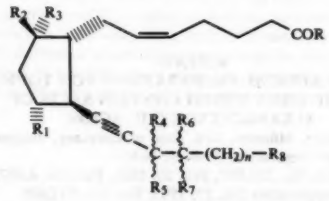
Division of Ser. No. 156,813, Jun. 5, 1980, abandoned, which is a continuation of Ser. No. 69,378, Aug. 24, 1979, abandoned, which is a continuation of Ser. No. 952,324, Oct. 18, 1978, abandoned. This application May 10, 1983, Ser. No. 493,294

Claims priority, application Italy, Nov. 15, 1977, 29654 A/77

Int. Cl.[4] A61K *177/00;* **C07D** *307/46*

U.S. Cl. 514—461 **18 Claims**

1. Compounds having the following formula (I)


(I)

where R is OH; C_1–C_{12} alkoxy with optional substitution by one or more phenyl groups, said phenyl groups being optionally substituted by C_1–C_6 alkyl or halo-C_1–C_6 alkyl, or heterocyclic radicals chosen from pyridyl, pyrazolyl and pyrazolinyl; or a

group where R′ and R″ are, independently of one another, hydrogen, C_1–C_6 alkyl, phenyl or heterocyclic, or a heterocyclic radical formed by R′, R″ and the nitrogen wherein the heterocyclic or heterocyclic radical is chosen from pyridyl, pyrazolyl or pyrazolinyl; the symbol —— represents a single or double bond, where, when —— is a double bond, R_1 is hydrogen and R_2 and R_3, taken together, form an oxo group, and when —— is a single bond, R_1 is hydroxy, R_2 is hydrogen and R_3 is either hydroxy, C_2–C_6 alkanoyloxy or benzoyloxy, or forms with R_2 an oxo group; one of R_4 and R_5 is hydroxy or C_1–C_6 alkoxy and the other is hydrogen, C_1–C_4 alkyl, phenyl, C_2–C_4 alkenyl or C_2–C_4-alkynyl; R_6 and R_7 are, independently of one another, hydrogen, C_1–C_4 alkyl, fluoro, phenyl or phenyl substituted by methyl, chloro, fluoro or trifluoromethyl; n is zero, 1, 2 or 3; R_8 is furyl unsubstituted or substituted with one or more substituents chosen from a group consisting of (a′) halogen (b′) trihalo-C_1–C_6-alkyl, (c′) C_1–C_4 alkyl, (d′) C_1–C_4 alkoxy, (e′) phenyl and (f′) phenoxy, and pharmaceutically or veterinarily acceptable salts thereof.

4,551,477

ESTERS OF ALKOXY-ACYLDERIVATIVES OF CARNITINE AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Claudio Cavazza, and Maria O. Tinti, both of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.P.A., Rome, Italy

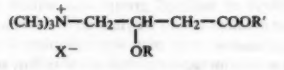
Continuation of Ser. No. 263,655, May 14, 1981, abandoned. This application Jun. 28, 1974, Ser. No. 625,715

Claims priority, application Italy, May 30, 1980, 48853 A/80

Int. Cl.[4] C07C *101/18;* **A61K** *31/22*

U.S. Cl. 514—547 **3 Claims**

1. An ester of alkoxy-carboxyl derivatives of carnitine having general formula (I):


(I)

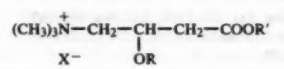
wherein:

X^- is a halogen anion selected from chlorine and bromine;

R is an alkoxy-substituted alkanoyl group radical having from 3 to 6 carbon atoms; and

R′ is an alkyl radical having from 1 to 6 carbon atoms.

3. A pharmaceutical composition for the treatment of cardiac disorders, hyperlipoproteinaemias, or hyperlipidaemias, comprising a therapeutically effective amount of an ester of carnitine of formula (I)


(I)

wherein:

X^- is a halogen anion selected from chlorine and bromine;

R is an alkoxy-substituted alkanoyl radical having from 3–6 carbon atoms; and

R′ is an alkyl radical having from 1 to 6 carbon atoms, and a pharmacologically acceptable excipient.

4,551,478

3-NITROBENZENE SULFONANILIDE DERIVATIVES AND FUNGICIDAL COMPOSITIONS FOR THE CONTROL OF PLANT DISEASES CONTAINING SAME

Tekeo Yoshimoto, Yokohama; Mitsumasa Umemoto, Ohmuta; Keiichi Igarashi, Musashino; Hideo Yamazaki, Yokohama; Yoshio Takasawa, Ayase, and Hirohisa Yanagita, Chigasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,634

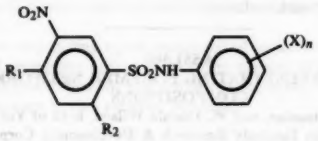
Claims priority, application Japan, Jun. 16, 1982, 57-102080

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] C07C *143/79*; A01N *41/06*

U.S. Cl. 514—603 8 Claims

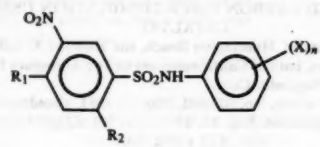
1. A 3-nitrobenzene sulfonanilide derivative having the formula:



(I)

wherein R_1 and R_2 are both hydrogen, R_1 is hydrogen and R_2 is methyl or R_1 is methyl and R_2 is hydrogen, and when R_1 and R_2 are both hydrogen, $(X)_n$ is 2,4,6-trichloro, 2-chloro-4-nitro or 2-chloro-5-nitro; when R_1 is hydrogen and R_2 is methyl, $(X)_n$ is 4-iodo, 2,5-dichloro, 3,5-dichloro, 2-bromo-4,5-dichloro or 2-chloro-4-nitro; and when R_1 is methyl and R_2 is hydrogen, $(X)_n$ is 4-iodo, 2,3-dichloro, 2,5-dichloro, 3,5-dichloro, 2-bromo-4,5-dichloro, 2-chloro-5-nitro, 2-methyl-6-nitro or 2-nitro-4-methyl.

3. A fungicidal composition for controlling soil-borne plant diseases containing, as the active ingredient, in the range of 2 to 5 weight percent for dusts, granules, and fine granules; in the range of 40 to 60 weight percent for wettable powders and flowable formulations; and in the range of 30 to 50 weight percent for emulsifiable concentrates, a 3-nitrobenzene sulfonanilide derivative having the formula:



(I)

wherein R_1 and R_2 are both hydrogen, R_1 is hydrogen and R_2 is methyl or R_1 is methyl and R_2 is hydrogen, and when R_1 and R_2 are both hydrogen, $(X)_n$ is 2,4,6-trichloro, 2-chloro-4-nitro or 2-chloro-5-nitro; when R_1 is hydrogen and R_2 is methyl, $(X)_n$ is 4-iodo, 2,5-dichloro, 3,5-dichloro, 2-bromo-4,5-dichloro or 2-chloro-4-nitro; and when R_1 is methyl and R_2 is hydrogen, $(X)_n$ is 4-iodo, 2,3-dichloro, 2,5-dichloro, 3,5-dichloro, 2-bromo-4,5-dichloro, 2-chloro-5-nitro, 2-methyl-6-nitro or 2-nitro-4-methyl.

4,551,479

COMPOUNDS WITH ANTI-CONVULSIVE PROPERTIES

David S. Savage, Glasgow, and James Redpath, Bishopbriggs, both of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

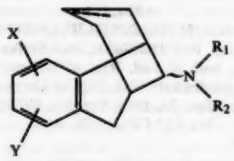
Filed Mar. 22, 1984, Ser. No. 592,102

Claims priority, application Netherlands, Mar. 29, 1983, 8301096

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—657 2 Claims

1. A method for the treatment of convulsions in human beings or animals which comprises administering to a patient suffering from convulsions an anti-convulsive effective amount of a compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 and R_2 each represent hydrogen or a $(C_1–C_4)$ alkyl group, the broken line indicates an optional extra bond, and X and Y each represent hydrogen $(C_1–C_4)$ alkyl or halogen, or a pharmaceutically acceptable acid addition salt thereof.

4,551,480

COMPOSITIONS FOR THE TREATMENT OF PSORIASIS

Werner K. Stiefel, Coral Gables, Fla., and Daniel W. Nicolai, Delmar, N.Y., assignors to Stiefel Laboratories, Inc., Coral Gables, Fla.

Continuation-in-part of Ser. No. 506,414, Jun. 21, 1983, abandoned. This application Mar. 2, 1984, Ser. No. 585,515

Int. Cl.[4] A61K *31/12*

U.S. Cl. 514—680 16 Claims

1. A topical anthralin cream composition in which the anthralin demonstrates improved stability, said composition comprising

(a)

(i) from about 0.05% to about 5%, by weight of the composition, of anthralin in

(ii) a water:fluid hydrocarbon emulsion having an oil continuous phase wherein the weight ratio of water to fluid hydrocarbon is at least about 5:1;

(b) an emulsifying amount up to about 3%, by weight of the composition, of at least one anionic emulsifying agent;

(c) from about 0.02% to about 2% by weight of the composition, of at least one oil soluble antioxidant; and

(d) one or more water soluble components which satisfy at least one of the functional categories of

(i) an acidic material in an amount of from about 0.5% to about 1%, by weight of the composition; and

(ii) at least one bifunctional sequestering agent in an amount of from about 0.02% to about 2%, by weight of the composition,

both of said functional categories being satisfied.

4,551,481

FLOOR CLEANING COMPOSITION

James A. Smith, Old Tappan, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Clifton, N.J.

Division of Ser. No. 684,384, Dec. 20, 1984, which is a continuation-in-part of Ser. No. 511,185, Jul. 6, 1983, and a continuation-in-part of Ser. No. 660,350, Oct. 12, 1984, abandoned. This application Mar. 28, 1985, Ser. No. 716,937

Int. Cl.[4] C08J *9/38*

U.S. Cl. 521—52 11 Claims

1. A composition for cleaning flooring fouled with oily or greasy soils comprising oil absorbent shreds of a hydrophilic polyurethane foam comprising an open-celled highly reticulated matrix, wherein said matrix incorporates an interior aqueous phase and abrasive particles silane coupled within said matrix and wherein the cells incorporate an absorbed exterior aqueous phase which is partially released from said shreds when the shreds are contacted with the flooring under condi-

tions of pressure wherein in said foam shreds have a particle size of about 5–20 mesh.

4,551,482

MACROPOROUS, HYDROPHILIC ENZYME CARRIER

Chung-Ji Tschang, Bad Durkheim, and Stefan Marcinowski, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,108
Int. Cl.[4] C08J 9/36, 9/40
U.S. Cl. 521—53 5 Claims

1. A macroporous, hydrophilic enzyme carrier in bead form which comprises a polymer charged with polyethyleneimine, said polymer being sulfonated after its formation and containing sulfo groups polyethyleneimine being neither crosslinked nor covalently bonded to the polymer.

4,551,483

FIRE-RETARDANT POLYURETHANE FOAM CONTAINING FINELY GROUND DRY FIRE-RETARDANT PARTICLES CONTAINING A VOLATILE ACTIVE FIRE-RETARDANT COMPONET

Hamilton Hicks, 60 Butternut Hollow Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 535,058, Sep. 23, 1983, Pat. No. 4,504,603. This application Sep. 13, 1984, Ser. No. 650,062
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—103 10 Claims

1. Fire-retardant polyurethane foam containing a fire-retardant amount of dry particles of at least one compound that produces a fire-retardant gas when heated by fire and is unstable when exposed to air with time, the particles being encapsulated by the polyurethane of the foam so as to be protected from the air until exposed to fire by burning of the foam, the particles being substantially uniformly distributed throughout the foam and comprising substantially uniformly intermixed particles of at least one compound of ammonium chloride or phosphate and at least one compound of sodium borate or bicarbonate, said foam being prepared by intermixing said compounds in finely ground and dry condition to form a powder mix which is dispersed throughout or blended in a polyol reactant and then blending there with an isocyanate so as to produce the foam.

4,551,484

TRANSPARENT, ANTIFOGGING COATING COMPRISED OF A PLASTIC MATERIAL CONTAINING A SURFACE ACTIVE AGENT

Helmer Rädisch, Aachen, and Werner Scholz, Pulheim, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 19, 1984, Ser. No. 632,465
Claims priority, application France, Jul. 22, 1983, 83 12139
Int. Cl.[4] C08L 75/00
U.S. Cl. 523—169 9 Claims

1. A method of manufacturing a coating or film comprised of a transparent highly elastic, 3-dimensionally cross-linked plastic material, which coating or film may be employed as an external anti-lacerative or self-healing layer of a laminated pane, wherein said coating or film is comprised of at least one surface active agent disposed within its cross-linked structure, wherein the coating or film is formed in advance in known fashion and is treated by placing it in contact with a formulation comprised of said at least one surface active agent, under conditions and for a duration sufficient to permit diffusion of molecules of the surface active agent(s) into at least a part of the interior of the coating or film.

4,551,485

POLY(ETHYLENE TEREPHTHALATE) BLENDS

Gary S. Ragan, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 4, 1984, Ser. No. 647,059
Int. Cl.[4] C08K 3/40
U.S. Cl. 523—212 19 Claims

1. In a thermoplastic composition for injection and extrusion molding prepared by blending or compounding components comprising a poly(ethylene terephthalate) containing a reinforcing amount of a reinforcing filler, an epoxidized crystallization promoter, and a nucleating agent, the improvement pursuant to which the composition has included therein a small amount of organofunctional silane having a plurality of readily hydrolyzable substituents, said amount of said silane being sufficient to increase the impact strength of an article molded from the composition as compared to the impact strength of the same article molded in the same way from the same composition absent such inclusion.

4,551,486

INTERPENETRATING POLYMER NETWORK COMPOSITIONS

Louis H. Tateosian, and W. Donald Wilson, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Nov. 16, 1983, Ser. No. 552,300
Int. Cl.[4] A61K 6/08; C08K 3/36, 9/06
U.S. Cl. 523—212 7 Claims

1. A polymerizable composite composition comprising:
a. about 10 to about 70 weight percent multifunctional vinyl crosslinking composition,
b. about 3 to about 70 weight percent of crosslinked polymer in the form of discrete particles having average cross-sections up to about 500 microns and being swellable in said composite composition,
c. about 3 to about 80 weight percent of inorganic filler comprising silanated silica and
d. vinyl functional silane monomer in an amount of about 0.001 to about 2 weight percent.

4,551,487

ENHANCED CARBON FIBER COMBUSTION USING A CATALYST

Camille A. Gaulin, Huntington Beach, and Howard A. Katzman, Los Angeles, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Continuation of Ser. No. 303,061, Sep. 17, 1981, abandoned. This application Aug. 15, 1983, Ser. No. 523,452
Int. Cl.[4] C08K 9/02
U.S. Cl. 523—215 1 Claim

1. A carbon-fiber-reinforced-resin matrix comprising filaments of a carbon fiber having introduced internally a fine dispersion of vanadium trioxide catalyst for enhancing combustion of the carbon fiber.

4,551,488

EPOXY RESIN BASED PROTECTIVE COATING COMPOSITION FOR PRINTED CIRCUIT BOARDS

Edward J. Leech, Oyster Bay, and Frank D. Russo, West Sayville, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation of Ser. No. 103,600, Dec. 14, 1979, Pat. No. 4,510,276, which is a continuation-in-part of Ser. No. 103,340, Dec. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 3,099, Jan. 12, 1979, abandoned. This application Jun. 29, 1984, Ser. No. 625,963
Int. Cl.[4] C08L 63/00, 63/02, 63/04
U.S. Cl. 523—427 22 Claims

1. In a permanent, protective coating composition useful in the manufacture of printed circuit boards, said coating composition comprised of a thermosetting epoxy resin and curing

composition dissolved in a solvent; and a flow promoter; said curing composition present in an amount sufficient to effect substantially complete cure of said thermosetting resin, said coating composition being in an initial state as a high viscosity solution and having an apparent viscosity between about 10,000 centipoise and about 200,000 centipoise, said coating composition upon curing, being transformed from said initial state into a final state as a solid, the improvement which comprises:

said thermosetting epoxy resin being a solid at room temperature, having a melting point between about 60° C. and about 200° C., and having an epoxide functionality greater than about 3;

said curing composition including:

a primary curing agent comprised of an alicyclic polyamine which is corrosive to copper surfaces, the primary curing agent being present in an amount sufficient to effect substantially complete cure of the thermosetting epoxy resin; and

a secondary curing agent comprised of an aromatic amine, said secondary curing agent being present in an amount sufficient to provide said cured coating composition with resistance to flux removal processes.

4,551,489

EMULSIONS OF DICYCLOPENTADIENE CONTAINING POLYESTERS

Charles E. Bayha, Collierville, Tenn., assignor to Alpha Corporation Of Tennessee, Collierville, Tenn.

Division of Ser. No. 419,773, Sep. 20, 1982, Pat. No. 4,447,577, and a continuation-in-part of Ser. No. 370,380, Apr. 21, 1982, abandoned. This application Feb. 23, 1984, Ser. No. 582,811

Int. Cl.⁴ C08L *67/00*

U.S. Cl. 523—501 **24 Claims**

1. A method of casting an aqueous polyester emulsion, said emulsion comprising at least about 20% by weight of a polyester and up to about 80% by weight water, said polyester formed from dicyclopentadiene, maleic acid, and a compound containing at least two alcoholic hydroxy groups, said dicyclopentadiene being present in a molar ratio of at least about one compared to said maleic acid, comprising:

pouring said emulsion into a mold, and

curing said emulsion.

4,551,490

ADHESIVE COMPOSITION RESISTANT TO BIOLOGICAL FLUIDS

Arthur Doyle, Wayne, and Frank M. Freeman, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 507,657, Jun. 27, 1983, abandoned. This application Dec. 30, 1983, Ser. No. 567,012

Int. Cl.⁴ C08L *1/26, 3/04, 5/02, 5/06*

U.S. Cl. 524—22 **25 Claims**

1. A pressure sensitive adhesive composition suitable for medical purposes consisting essentially of a substantially homogeneous mixture on a percent weight basis of from about 5% to about 30% by weight of one or more polyisobutylenes or a blend of one or more polyisobutylenes and butyl rubber, from about 3.0% to about 20% by weight of one or more styrene radial or block type copolymers, from about 8.0% to about 40% by weight of mineral oil, from about 15% to about 65% by weight of one or more water soluble hydrocolloid gums, up to about 15% by weight of one or more water swellable cohesive strengthening agents provided that said water soluble hydrocolloid gums and said water swellable cohesive strengthening agents together are present at from about 15% to about 65% by weight of said composition, and from about 7.5% to about 15% by weight of a tackifier.

4,551,491

PEARLESCENT AUTOMOTIVE PAINT COMPOSITIONS

Sol Panush, Framington Hills, Mich., assignor to Inmont Corporation, Clifton, N.J.

Continuation of Ser. No. 518,583, Jul. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 440,764, Nov. 10, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 677,909

Int. Cl.⁴ C09C *1/00*

U.S. Cl. 524—31 **4 Claims**

1. A substrate material coated with at least two layers of polymer including a basecoat comprising a pigmented thermosetting or thermoplastic resin and a transparent topcoat on the basecoat, wherein the pigment in the basecoat consists essentially of iron oxide encapsulated mica particles, the mica particles being about 5 microns to about 60 microns nominal longitudinal dimension and having a thickness of about 0.25 micron to about 1 micron, the mica representing about 40% to about 80% by weight of the total weight of the particle, and the oxide encapsulation contains about 0.1% to about 3.5% chromium hydroxide based on total weight of the particle.

4,551,492

POLYESTER COATING COMPOSITION

Armand Aerts, Bekkevoort, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1984, Ser. No. 686,916

Int. Cl.⁴ C08L *1/14, 67/08*

U.S. Cl. 524—40 **3 Claims**

1. A coating composition consisting essentially, in percent by weight based on the binder, of a binder consisting essentially of about

37.5–40% polyester resin having a Tg above 30° C.,

24.5–26% partially butylated melamine crosslinker resin,

6–10% polyurea plasticizer,

8% polyethylene vinyl acetate copolymer wax dispersion,

16% of a mixture of two cellulose acetate butyrate resins having different ranges of molecular weight, as indicated by Ford Cup viscosities in solution in butyl acetate, including 30–50% of a first cellulose butyrate acetate resin having such a molecular weight indication of about 2 seconds and 50–70% of a second such resin having such a molecular weight indication of about 20 seconds,

plus optionally pigments and extenders, said binder with any pigments and extenders being dispersed in a liquid media comprising organic solvents at a binder solids content of about 18% by weight.

4,551,493

TRANSPARENT FLAME-RETARDANT POLY(ARYLETHER-ARYLSULFONE) MOLDING MATERIALS

Gerd Blinne, Bobenheim, and Volker Muench, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,715

Int. Cl.⁴ C08L *81/06*

U.S. Cl. 524—89 **8 Claims**

1. A transparent, flame-retardant molding composition which comprises:

poly(arylether-arylsulfone) molding material, and

an effective amount of a poly(2,6-dibromophenylene 1,4-oxide) as a flameproofing agent.

4,551,494
ANTISTATIC POLYPHENYLENE ETHER COMPOSITIONS

Johannes H. G. M. Lohmeijer, Hoogerheide, Netherlands, assignor to General Electric Company, Selkirk, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,137

Claims priority, application Netherlands, Oct. 29, 1982, 8204180

Int. Cl.⁴ C08L *79/04*

U.S. Cl. 524—89 **5 Claims**

1. A polymer mixture consisting essentially of:

(a) a base resin selected from the group consisting of polyphenylene ether resins and polyphenylene ether resins modified with alkenyl aromatic resins; and

(b) an amount of antistatic agent effective for improving the antistatic character of said polymer mixture wherein said antistatic agent is a compound of the formula R—SO_3X, where R is an alkyl or aralkyl radical having 5 to 25 carbon atoms and X is an alkali metal; and

(c) an amount of a dye effective for compensating for a discoloration of said polymer mixture upon exposure to light wherein said dye bleaches upon exposure to light.

4,551,495
WEATHER-RESISTANT POLYAMIDES

Bert Brassat; Hans-Josef Buysch; Karl H. Hermann, and Heinrich Haupt, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 461,698, Jan. 28, 1983, abandoned. This application Nov. 18, 1983, Ser. No. 553,148

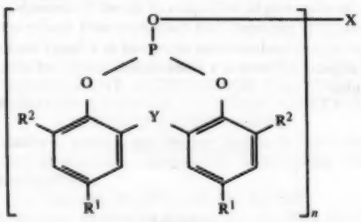
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1982, 3204334

Int. Cl.⁴ C08K *5/34*

U.S. Cl. 524—94 **9 Claims**

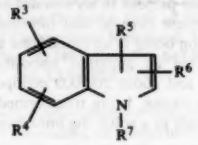
1. A weather-resistant polyamide moulding composition containing a stabilizer combination consisting essentially of:

(1) a phosphorous acid ester corresponding to the formula (I):



in which R^2 in each case independently represents a benzyl, α-methylbenzyl, α,α-dimethylbenzyl, cyclopentyl of cyclohexyl radical, R^1 in each case independently represents an alkyl radical, a cycloalkyl radical, in an aralkyl radical or an aryl radical, Y in each case independently represents S or HC-R^3 where R^3 represents H, an alkyl radical or a cyclohexyl radical, X represents a hydrogen atom, a single-bond to four-bond straight-chain or branched aliphatic radical, an aralkyl radical or an aromatic radical; each of the radicals may contain at least one olefinic double bond and/or a heteroatom selected from N, O and S, and n is an integer of from 1 to 4, with proviso that, where X is H, n is 1, and

(2) an indole derivative corresponding to the formula (II):



in which R^3 to R^6 may be the same or different and represent a hydrogen atom, an alkyl, aryl, aralkyl, cycloalkyl, hydroxy, alkoxy or alkenyl radical, and R^7 represents an alkenyl, aryl or acyl group unsubstituted or substituted by —OR^8, —CN or —$COOR^8$ wherein R^8 is alkyl having 1 to 6 carbon atoms or cycloalkyl having 5 or 6 carbon atoms; and wherein the total stabilizer composition is 0.04 to 5% by weight and compound (II) amounts to 0.02 to 3% by weight of the moulding composition.

4,551,496
THERMOPLASTIC MOLDING OF SINTERABLE SILICON CARBIDE

Gary M. Renlund, Scotia, and Curtis A. Johnson, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,031

Int. Cl.⁴ C04B *35/56*; C08L *91/00*

U.S. Cl. 524—322 **26 Claims**

1. A thermoplastically moldable ceramic composition consisting essentially of a substantially homogeneous dispersion consisting essentially of from about 40% by volume to about 60% by volume of a sinterable silicon carbide powder having an average particle size which is submicron and which consists essentially of silicon carbide, a boron additive selected from the group consisting of boron and boron carbide in an amount equivalent to from about 0.3% by weight to about 3% by weight of boron based on said silicon carbide, and an amount of a carbonaceous additive selected from the group consisting of free carbon, a carbonaceous organic material and mixtures thereof equivalent to from about 0.1% to about 5% by weight of free carbon based on said silicon carbide, said carbonaceous organic material completely decomposing at a temperature ranging from 50° C. up to 450° C. to said free carbon and gaseous product of decomposition, and from about 40% by volume to about 60% by volume of a binder consisting essentially of an organic acid containing from 12 to 26 carbon atoms per molecule and having a melting point ranging from about 44° C. to about 88° C. and a thermoplastic copolymer of ethylene and from greater than about 12 weight % to about 33 weight % vinyl acetate, said copolymer having a melt index ranging from about 8 to about 43, said organic acid ranging from greater than about 18% by weight up to about 45% by weight of the total weight of said binder.

4,551,497
METHOD OF PRODUCING SURFACE-TREATED BARIUM SULFATE

Kiyoshi Shinozuka; Koichi Otu, and Hiroshi Fukumoto, all of Iwaki, Japan, assignors to Onahama Sakai Kagaku Kabushiki Kaisha, Fukushima, Japan

Division of Ser. No. 486,962, Apr. 20, 1983, Pat. No. 4,505,755. This application Dec. 31, 1984, Ser. No. 688,153

Claims priority, application Japan, Dec. 28, 1982, 57-229842; Dec. 28, 1982, 57-229843

Int. Cl.⁴ C09C *1/28*; C01G *23/06*

U.S. Cl. 524—423 **15 Claims**

1. A resin composition which includes surface-treated barium sulfate particles therein, the barium sulfate particles being produced by a method which comprises:

(a) adding an aqueous solution of an alkali silicate to an aqueous feed slurry of barium sulfate which contains

barium ions in excess, the alkali silicate being added in amounts of 0.1–30% by weight in terms of silicate based on the weight of barium sulfate in the slurry, to deposit barium silicate on the surface of barium sulfate in the slurry; and then,

(b) adding a mineral acid to the resultant slurry and adjusting it to a pH not greater than about 7 to decompose the barium silicate to hydrous silica.

4,551,498

POLYETHER POLYURETHANE PREPOLYMERS CONTAINING FINELY DIVIDED INORGANIC PARTICLES AND CAST ELASTOMERS MADE THEREFROM

Robert P. Yeater, Moundsville; Richard S. Pantone, New Martinsville, and James N. Rieck, Wheeling, all of W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 487,657, Apr. 22, 1983, abandoned. This application May 3, 1984, Ser. No. 606,492

Int. Cl.⁴ C08L *75/04*

U.S. Cl. 524—424 **11 Claims**

1. A polyether polyurethane prepolymer comprising the reaction product of an organic diisocyanate and a linear poylhydroxyl polyether, said polyhydroxyl polyether having a molecular weight of less than 8000, said diisocyanate and said polyhydroxyl polyether being reacted in an isocyanate to hydroxyl equivalent ratio of from 1.1:1 to 5:1, said prepolymer further comprising finely divided inorganic particles present in an amount of from 0.01 to 1% based on the weight of said reaction product.

4,551,499

POLYMERIC DIELECTRICS

Brian A. Cranfield, Southgate; John C. Fothergill, Harlow, and Susan V. Wolfe, Ware, all of Great Britain, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 8, 1984, Ser. No. 639,666

Claims priority, application United Kingdom, Aug. 9, 1983, 8321390

Int. Cl.⁴ C08K *5/01*

U.S. Cl. 524—487 **3 Claims**

1. A thermoplastic polymer dielectric selected from the group consisting of polyethylene and polypropylene and having incorporated therein a nucleating agent, said nucleating agent comprising ceresin wax having an average particulate diameter of less than one micron, said nucleating agent being incorporated in an amount of about 0.01–5 weight percent whereby the average polymer spherulite size is reduced and the breakdown field strength of the polymer is increased.

4,551,500

BLENDS OF A RUBBER-MODIFIED VINYL CHLORIDE RESIN, AN UNMODIFIED VINYL CHLORIDE RESIN, AND A POLYMER OF A VINYL AROMATIC MONOMER AND AN UNSATURATED DICARBOXYLIC ACID ANHYDRIDE MONOMER

Kenneth W. Doak, 3469 Burnett Dr., Murrysville, Pa. 15668

Continuation-in-part of Ser. No. 494,708, May 16, 1983, Pat. No. 4,469,844, and a continuation-in-part of Ser. No. 494,709, May 16, 1983, Pat. No. 4,469,845. This application Aug. 2, 1984, Ser. No. 636,961

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.⁴ C08L *51/04*

U.S. Cl. 525—71 **19 Claims**

1. A polyblend composition comprising:

(a) 80 to 20 percent by weight of;

(1) 90 to 30 percent by weight of a rubber-modified vinyl chloride resin, containing 0 to 20 percent, based on total monomers, of a copolymerizable, ethylenically unsaturated comonomer, said resin prepared by polymerization of vinyl chloride monomer and the comonomer in the presence of 15 to 50 percent, based on the weight of the resin, of a rubber to form a graft copolymer; and

(2) 10 to 70 percent by weight of a vinyl chloride resin, containing 0 to 20 percent, based on total monomers, of a copolymerizable, ethylenically unsaturated comonomer, which is not rubber-modified;

wherein a major amount of the polymerized vinyl chloride homopolymer or copolymer present in the total amount of (1) and (2) is ungrafted to the rubber of said rubber-modified vinyl chloride resin; and wherein said ethylenically unsaturated comonomer in (1) and (2) is selected from the group consisting of ethylene, propylene, an alpha-olefin containing 4 to 8 carbon atoms, vinyl acetate, vinyl stearate, a vinyl alkyl ether in which the alkyl group contains 4 to 20 carbon atoms, vinylidene chloride, alkyl acrylate, acrylic acid, methacrylic acid and methyl methacrylate; and

(b) 20 to 80 percent by weight of a polymer of a vinyl aromatic monomer and an unsaturated dicarboxylic acid anhydride monomer in weight ratios of 95:5 to 70:30, and 0 to 25 percent, based on total monomers, of a copolymerizable, ethylenically unsaturated termonomer, selected from the group consisting of methyl methacrylate, acrylonitrile, and methacrylonitrile.

4,551,501

CRYSTALLINE PROPYLENE POLYMER COMPOSITION

Akinobu Shiga, Tokyo; Masahiro Kakugo, Chiba; Junpei Kojima, Chiba, and Kizuku Wakatsuki, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 27, 1984, Ser. No. 686,866

Claims priority, application Japan, Dec. 27, 1983, 58-248520

Int. Cl.⁴ C08L *23/12, 23/14, 53/00*

U.S. Cl. 525—88 **10 Claims**

1. A crystalline propylene polymer composition comprising a blend of a crystalline polypropylene with a polymer of a vinyl cycloalkane having at least 6 carbon atoms, said composition containing 0.05 weight ppm to 10,000 weight ppm of the vinyl cycloalkane unit.

4,551,502

MACROMOLECULAR COMPLEXES OF AMIDOCARBONYLIC WATER-SOLUBLE POLYMERS AND SQUARE PLATINOUS AND EQUIVALENT ORGANOMETALLICS

Bobby A. Howell, 1948 Willow Dr., Mt. Pleasant, Mich. 48858, and Erik W. Walles, 216 E. South St. Apt. #1, Woodstock, Ill. 60098

Continuation-in-part of Ser. No. 75,722, Sep. 14, 1979, Pat. No. 4,405,757. This application Sep. 19, 1983, Ser. No. 533,516

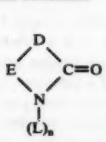
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.⁴ C08F *8/42*

U.S. Cl. 525—326.9 **53 Claims**

1. As a composition of matter, a chemical complex, comprising:

a. a water-soluble compound having at least one amidocarbonylic unit in its structure and corresponding to either of the formulas:

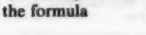


wherein C is carbon, N is nitrogen, O is oxygen, D is a divalent unit selected from the group consisting of oxygen, amino, linear alkylene having from 1 to 4 carbon atoms in the alkylene portion, methylene carbonyl, ethyl-

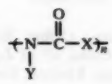
ene carbonyl and amido anhydride; E is an organic unit which introduces from 2 to 3 carbon atoms into the heterocyclic ring; L is selected from the group consisting of vinyl, allyl or isopropenyl, n is an integer ranging from one to about 5,000; or

(II)

wherein Q is either a linear or branched alkylene group of the formula

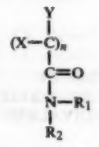


wherein R_S is either hydrogen, or lower alkyl having from 1 to 7 carbon atoms in the alkyl portion; R is either alkyl, haloalkyl, or aminoalkyl having from about 1 to 10 carbon atoms in the alkyl portion, and y is an integer from about 2 to about 5000; or



(III)

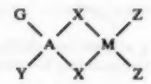
where X is either alkyl, hydroxyalkyl, carboxyalkyl or aminoalkyl having from 1 to about 20 carbon atoms in the alkyl portion, or aryl, heteroaryl or substituted aryl; Y is either hydrogen or any X; n is an integer ranging from 1 to about 5000; or



(IV)

where X is as defined above in (III), Y is either hydrogen or any X; R_1 is any Y; R_2 is any Y; n is an integer ranging from 1 to about 5000; and

(b) a square planar organometallic compound corresponding to the formula:



wherein M is a metal selected from either Group I B or Group VIII B of the Periodic Table, A is a substituted aromatic or heteroaromatic compound having substituents which function as a component of a bidentate ligand; X is an ortho substituent or a heteroatom which can bond to the metal; Y is either a substituted or unsubstituted amino group, sulfoxy, sulfhydryl, nitro, sulfonyl, amino, thiosulfonyl, ureido, amido, ureylene, hydroxy or carboxy; G is either hydrogen or any Y, and Z is, each, independently, a monodentate ligand or bonding sites within a multidentate ligand.

4,551,503

PREPARATION OF INTERPOLYMERS OF ALPHA-OLEFINS AND NONCONJUGATED ALPHA, OMEGA-DIENES

Joginder Lal, Akron, and Michael L. Senyek, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 861,600, Dec. 19, 1977, Pat. No. 4,340,705, which is a continuation-in-part of Ser. No. 694,851, Jun. 10, 1976, abandoned. This application Jan. 25, 1982, Ser. No. 342,261

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.[4] C08F *236/20*

U.S. Cl. 525—332.1 **7 Claims**

1. Vulcanizates of sulfur-vulcanizable interpolymers having improved properties including tensile strength greater than 2000 psi, elongation at break in the range of 400 to 650%, and crosslink density was measured by swelling ratio value, Q of less than 4.0, said interpolymers being obtained by copolymerization of from 95 to 75 mole percent of at least one α-olefin containing from 4 to 12 carbon atoms and 5 to 25 mole percent of at least one α,ω-diene containing at least 8 carbon atoms in the presence of a coordination catalyst prepared from Components (A) an organoaluminum compound, (B) a transition metal compound selected from Group IVB of the Periodic Table, and (C) at least one compound of the general formula: $Q=P(XY_n)_3$ wherein Q is oxygen or sulfur, P is phosphorous, Y is a hydrocarbyl radical containing from 1 to 20 carbon atoms, and X is oxygen, sulfur or nitrogen, and n is an integer having values of 1 or 2, with the proviso that when X is oxygen or sulfur, then n is 1 and when X is nitrogen, then is 2.

4,551,504

WATER CURABLE, AZIDE SULFONYL SILANE MODIFIED ETHYLENE POLYMERS

Austin E. Barnabeo, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 18, 1984, Ser. No. 570,784

Int. Cl.[4] C08F *8/34*

U.S. Cl. 525—333.9 **12 Claims**

1. A water-curable polymer of a hydrolyzable, azide sulfonyl silane and a substantially linear, low pressure ethylene polymer having a density of about 0.850 to about 0.970 prepared by reacting a mixture of about 75 to about 96 mole percent ethylene and about 4 to about 25 mole percent butene-1, wherein the amount of said azide reacted with said ethylene polymer to produce said water-curable polymer is about 0.1 to about 4.0 percent by weight based on the weight of said ethylene polymer.

4,551,505

PROCESS FOR CROSSLINKING CHLORINATED POLYETHYLENE

Michael Sauerbier, Altrip, and Helfried Ehrend, Speyer, both of Fed. Rep. of Germany, assignors to Rhein-Chemie Rheinau GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,228

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336753

Int. Cl.[4] C08F *8/34, 8/30*

U.S. Cl. 525—346 **1 Claim**

1. In the process for crosslinking chlorinated polyethylene in the presence of 2,5-dimercapto-1,3,4-thiadiazole or a DMTD derivative and a basic material, the improvement comprises the basic material being an amido amine corresponding to the formula

$$R_2—CO—(NH—CH_2—CH_2)_m—NH—CO—R_3$$

in which

R_2 and R_3 are the same or different and represent a straight-

chain, saturated alkyl radical containing from 8 to 18 carbon atoms and

m is an integer of from 2 to 5.

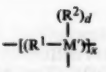
4,551,506

CATIONIC POLYMERS HAVING CLAY SOIL REMOVAL/ANTI-REDEPOSITION PROPERTIES USEFUL IN DETERGENT COMPOSITIONS

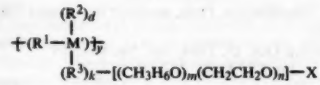
Eugene P. Gosselink, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 23, 1982, Ser. No. 452,655
Int. Cl.⁴ C08G *73/04;* C11D *3/48*
U.S. Cl. 525—417 **10 Claims**

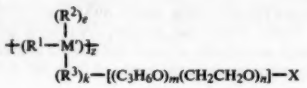
1. A water-soluble cationic polymer having clay soil removal/anti-redeposition properties which consists essentially of units having formulas VII, VIII, and IX:



VII



VIII



IX

wherein R^1 is C_2–C_{12} alkylene, hydroxyalkylene, alkenylene, cycloalkylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—N bonds are formed; R^2 is C_1–C_4 alkyl or hydroxyalkyl, or the moiety $-(R^3)_k-[(C_3H_6O)_m(CH_2CH_2O)_n]-X$; R^3 is C_1–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene; M′ is an N^+ or N center; X is H,

$-R^4$ or a mixture thereof, wherein R^4 is C_1–C_4 alkyl or hydroxyalkyl; d is 1 when M′ is N^+ and is 0 when M′ is N; e is 2 when M′ is N^+ and is 1 when M′ is N; k is 1 or 0; m and n are numbers such that the moiety $-(CH_2CH_2O)_n-$ comprises at least about 85% by weight of the moiety $-[(C_3H_6O)_m(CH_2CH_2O)_n]-$; m is from 0 to about 5; n is at least about 3; the number of x, y and z are such that there are at least 10M′ groups, at least 2N+ centers and at least 2 X groups.

4,551,507

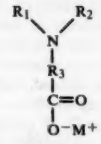
POLYESTER COMPOSITION CONTAINING TERTIARY AND QUATERNARY AMINE CARBOXYLATE SALTS

John C. Haylock, Dennysville, Me., and Nicholas Vanderkooi, Jr., Pompton Plains, N.J., assignors to Allied Corporation, Morris Township, N.J.

Filed Dec. 17, 1984, Ser. No. 682,714
Int. Cl.⁴ C08G *63/76*
U.S. Cl. 525—437 **30 Claims**

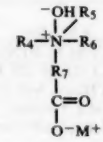
1. A composition comprising:

a linear saturated polyester; and from about 0.1 to 20 percent by weight of an amine carboxylate salt selected from the group consisting of a tertiary amine carboxylate salt and a quaternary amine carboxylate salt, the tertiary carboxylate salt having the formula:



wherein R_1 and R_2 are selected from the group consisting of aryl, alkyl, or alkoxy groups having 1–36 carbon atoms, R_3 is an alkyl group having 1–10 carbon atoms, and M is selected from Group I or Group II of the Periodic Table; and

a quaternary amine carboxylate salt having the formula:



wherein R_4, R_5, and R_6 are selected from the group consisting of aryl, alkyl, and alkoxy groups having 1–36 carbon atoms and H, R_7 is an alkyl group having 1–10 carbon atoms and M is selected from Group I or Group II of the Periodic Table.

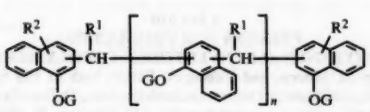
4,551,508

POLYGLYCIDYL ETHERS, PROCESS FOR PRODUCTION THEREOF, AND CURED PRODUCTS THEREOF

Takanori Urasaki, Iwakuni, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,306
Claims priority, application Japan, May 25, 1983, 58-90621
Int. Cl.⁴ C08G *59/08*
U.S. Cl. 525—507 **20 Claims**

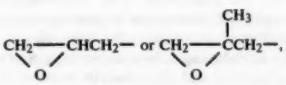
1. A polyglycidyl ether represented by the following formula (I)



(I)

wherein

G represents a hydrogen atom,



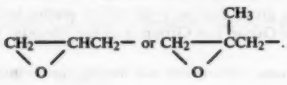
R^1 represents a hydrogen atom, an aliphatic hydrocarbon group having 1 to 10 carbon atoms, an alicyclic hydrocarbon group having 5 to 10 carbon atoms, an aromatic hydrocarbon group having 6 to 10 carbon atoms or a 5- or 6-membered heterocyclic group containing an oxygen or sulfur atom as a hetero atom, provided that the foregoing groups other than the hydrogen atom may be substituted by a halogen atom or the group —OG in which G is as defined,

R^2 represents a hydrogen atom or the group

in which G and R^1 are as defined, and

n is a positive number up to 10,

provided that all groups G, all groups R^1 and all groups R^2 in the molecule may respectively be identical or different but at least two G groups in the molecule are



4,551,509

PROCESS FOR MANUFACTURING HOMOPOLYMERS AND COPOLYMERS OF ETHYLENE

Okada Takayuki; Tanaka Hisao, both of Ichihara; Sawara Ken-Ichi, Ibaragi, and Konaka Tsutomu, Ichihara, all of Japan, assignors to Societe Chimique des Charbonnages S.A., Paris la Defense, France

Filed Jul. 29, 1983, Ser. No. 518,445

Claims priority, application Japan, Jul. 29, 1982, 57-133139

Int. Cl.[4] C08F *2/00*; C08G *85/00*

U.S. Cl. 526—68 **5 Claims**

1. A process for producing ethylene polymers or ethylene copolymers comprising the steps of: (a) continuously polymerizing ethylene or ethylene and an α-olefin in a reaction mixture at a pressure of at least 300 kg/cm^2 and a temperature of at least 130° C. in the presence of a catalyst composed of a compound of a transition metal of groups IVa to VIa of the Periodic Table and an organometallic compound of a metal of groups I to III of the Periodic Table; (b) adding a polyalkylene glycol to said reaction mixture to deactivate said catalyst, the molar ratio of said polyalkylene glycol to the metals of groups IVa to VIa and Groups I to III of the Periodic Table in said catalyst being between 0.4 and 15, and the molecular weight of said polyalkylene glycol being between 300 and 5000; (c) separating product polymer or copolymer from unreacted monomer; and (d) recycling said unreacted monomer to said polymerization step.

4,551,510

PROCESS FOR PRODUCING STYRENIC/ALKENYLNITRILE COPOLYMERS

Jeffrey D. Morris, and Robert A. Fuller, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 423,488, Sep. 24, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 642,219

Int. Cl.[4] C08F *212/10*

U.S. Cl. 526—68 **23 Claims**

1. A process for the continuous mass polymerization of styrenic and alkenylnitrile monomers to produce a styrenic-/alkenylnitrile copolymer, comprising the steps of:

(a) continuously introducing a feed comprising a predetermined ratio of styrenic and alkenylnitrile monomers into a reation vessel to produce a reation mixture;

(b) subjecting the reaction mixture containing styrenic and alkenylnitrile monomers to conditions of temperature and pressure under which said monomers copolymerize to produce a liquid containing styrenic/alkenylnitrile copolymer and styrenic and alkenylnitrile monomers;

(c) subjecting the reaction mixture to agitation sufficient to maintain a substantially uniform composition distribution and a substantially uniform temperature distribution throughout the reaction mixture;

(d) continuously withdrawing at least part of a liquid containing styrenic/alkenylnitrile copolymer and styrenic and alkenylnitrile monomers from the reaction vessel; and

(e) cooling the reaction mixture by withdrawing vapor phase containing vaporized styrenic and alkenylnitrile monomer from the reaction vessel to a condenser, condensing the vaporized styrenic and alkenylnitrile withdrawn from the reaction vessel by contact with a cooled condensing surface to produce a condensed monomer-containing liquid and returning at least a part of the condensed monomer-containing liquid to the reaction vessel, wherein said cooling step further comprises controlling the amount of vaporized monomers withdrawn from the reaction vessel by varying the amount of cooled surface area available for contact with the withdrawn vaporized monomers in response to the temperature in the reaction vessel, whereby the amount of vaporized monomers condensing is controlled.

4,551,511

MALEIC ANHYDRIDE/STYRENE COPOLYMERIZATION CONTROLLED WITH OXAZOLINES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 19, 1984, Ser. No. 662,759

Int. Cl.[4] C08F *212/08, 112/08*

U.S. Cl. 526—204 **4 Claims**

1. The process for preparing maleic anhydride/styrene copolymers of higher molecular weight comprising heating a mixture of maleic anhydride, styrene and a small amount of an oxazoline at a temperature in the range of from 50° to 150° C.

4,551,512

WATER-SOLUBLE POLYMERS HAVING A LOW HYGROSCOPICITY

Ferdinand Straub, Hockenheim; Axel Sanner, Frankenthal; Karl Seib, Weinheim, and Siegfried Lang, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,665

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312668

Int. Cl.[4] C08F *218/04, 218/08, 220/20, 226/10*

U.S. Cl. 526—264 **2 Claims**

1. A water-soluble terpolymer which consists of

(a) from 10 to 40% by weight of N-vinylpyrrolidone,

(b) from 20 to 50% by weight of vinyl acetate (VAc) or vinyl propionate and

(c) from 10 to 40% by weight of hydroxyethyl acrylate, hydroxypropyl acrylate or hydroxyethyl methacrylate.

4,551,513

WATER SOLUBLE COPOLYMERS

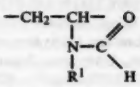
Friedrich Engelhardt, Frankfurt; Klaus Kuhlein, Kelkheim; Ulrich Riegel, Frankfurt; Sigmar von Halasz, Kelkheim, all of Fed. Rep. of Germany; Jeffery C. Dawson, Katy, and Anthony R. Reed, Houston, both of Tex., assignors to Cassella Aktiengesellschaft, Fed. Rep. of Germany and Dresser Industries, Inc., Houston, Tex.

Continuation of Ser. No. 534,083, Sep. 20, 1983, abandoned, which is a continuation of Ser. No. 216,671, Dec. 15, 1980, abandoned. This application Oct. 18, 1984, Ser. No. 663,326

Int. Cl.[4] C08F *20/54*

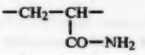
U.S. Cl. 526—307.1 **17 Claims**

1. Copolymers soluble in water and aqueous acids containing a statistical distribution of 5 to 50% by weight of moieties of formula I



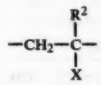
(I)

10 to 95% by weight of moieties of formula II



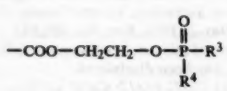
(II)

and 1 to 85% by weight of moieties of formula III



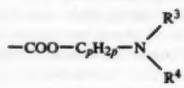
(III)

wherein R^1 stands for hydrogen, methyl or hydroxymethyl, R^2 stands for hydrogen or methyl and X stands for cyano, the carboxyl group or its alkali or ammonium salts, the alkoxycarbonyl group having 1 to 6 carbon atoms, the hydroxyalkoxycarbonyl group having 1 to 3 carbon atoms, the N-methylolamidocarbonyl group, methylol, methylol etherified with alkanols having 1 to 4 carbon atoms, alkanoylamino group having 1 to 4 carbon atoms, alkanoylamino of 1 to 4 carbon atoms N-substituted with methylol or alkyl having 1 to 4 carbon atoms, pyridinium pyrrolidonyl-(1), phenyl, the phosphonic acid group, alkali or ammonium salts of the phosphonic acid group, a moiety of the formula IV



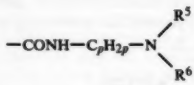
(IV)

wherein R^3 and R^4 are the same or different and represent alkyl having 1 to 4 carbon atoms, a moiety of the formula V



(V)

wherein p is a number from 1 to 4, a moiety of the formula VI



(VI)

wherein R^5 and R^6 are the same or different and each is alkyl having 1 to 4 carbon atoms, or the quaternary ammonium salt of formula (V) and (VI).

4,551,514

BIAXIALLY ORIENTED FILMS OF BUTENE-1 HOMOPOLYMER AND COPOLYMERS

Charles L. Rohn, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 264,895, May 18, 1981, Pat. No. 4,385,022. This application Sep. 30, 1982, Ser. No. 429,659

Int. Cl.⁴ D01D 5/12

U.S. Cl. 526—348.1 **4 Claims**

1. A polymer consisting essentially of polymerized butene-1 and up to 10 mole percent of another olefin; which, upon extrusion, has been rapidly reduced in temperature to a temperature of from below 0° C. to −196° C. to solidify the polymer in the amorphous state and, while being continuously maintained at below 0° C. to inhibit the formation of crystals therein, biaxially stretched to produce an oriented film of improved clarity compared to a film of similar composition which has been similarly biaxially stretched while in other than its amorphous state.

4,551,515

PROCESS FOR THE CONTINUOUS MANUFACTURE OF SILICONE GUMS

Michael J. Herberg, Troy; Rudolph F. Macander, Clifton Park, and Todd R. Stegman, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,060

Int. Cl.⁴ C08G 77/06

U.S. Cl. 528—18 **25 Claims**

1. A process for the continuous polymerization of polydiorganosiloxanes comprising:

(a) mixing one or more cyclopolysiloxane monomers with one or more chainstopping agents,

(b) preheating the mixture resulting from (a),

(c) adding to the preheated mixture of (b) an amount of catalyst effective for catalyzing a polymerization reaction,

(d) polymerizing the catalyzed mixture of (c) in a screw extruder having essentially plug flow therethrough, and

(e) adding to the resulting polydiorganosiloxane an amount of neutralizing agent effective for neutralizing said catalyst.

2. A process for the continuous polymerization of polydiorganosiloxane comprising:

(a) mixing one or more cyclopolysiloxane monomers with one or more chainstopping agents,

(b) preheating the mixture resulting from (a),

(c) adding to the preheated mixture of (b) an amount of catalyst effective for catalyzing a polymerization reaction,

(d) partially polymerizing the catalyzed mixture of (c) in a static mixer and/or a scraped surface reactor having essentially plug flow therethrough,

(e) passing the partially polymerized mixture of (d) to a screw extruder having essentially plug flow therethrough and completing the polymerization reaction therein, and

(f) adding to the resulting polydiorganosiloxane an amount of neutralizing agent effective for neutralizing said catalyst.

13. A process as set forth in claims 1 or 2 wherein the catalyst is potassium silanolate and the neutralizing agent is silyl phosphate.

4,551,516

COATING COMPOSITION AND THE USE THEREOF

Kazuo Kitamura, Otsu, and Mitsuru Suezawa, Shiga, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

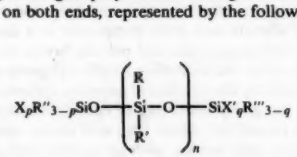
Filed May 17, 1983, Ser. No. 495,578

Int. Cl.⁴ C08G 77/06

U.S. Cl. 528—18 **11 Claims**

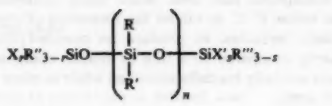
1. A coating composition comprising the combination of

(a) a diorganopolysiloxane having 1 to 3 functional groups on both ends, represented by the following formula I,



I

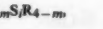
(b) a diorganopolysiloxane having 1 to 3 functional groups on only one end, represented by the following formula I',



I'

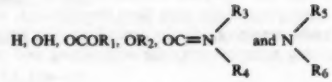
and

(c) a cross-linking agent other than (a) or (b), and having two or more functional groups capable of undergoing condensation reactions with said functional groups, and represented by the formula



wherein X and R are as defined for Formula I, m is an integer of 2 to 4, or a condensate thereof,

wherein in said formulas I and I' the designations R, R', R'' and R''' each independently represent an alkyl, alkenyl or aryl group from 1 to 10 carbon atoms, which may optionally have suitable substituents, X and X' each independently represents a functional group selected from the group consisting of halogen,



in which R_1, R_2, R_3, R_4, R_5, and R_6 each independently represents unsubstituted or substituted alkyl from 1 to 10 carbon atoms, n is a number from 100 to 10,000, p and q are independently integers from 1 to 3, r and s are integers from 0 to 3, wherein one of r and s is 0, and r is an integer from 1 to 3 when s is 0, and when r is 0 s is an integer from 1 to 3.

4,551,517

TWO-COMPONENT POLYURETHANE ADHESIVE

Julius Herold, Hilden; Hermann Kluth, Duesseldorf; Alfred Meffert, Monheim, and Manfred Leder, Hilden, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,862

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347045

Int. Cl.[4] C08G *18/48*

U.S. Cl. 528—60 **17 Claims**

1. A two-component polyurethane adhesive preparation consisting of

(A) an isocyanate compound having a functionality of from 2 to 10, as hardener, and

(B) A substantially anhydrous polyol, as resin, Components (A) and(B) being separately storable prior to their combination and at least one of said components being adapted to contain adhesive auxiliaries selected from the group consisting of solvents, accelerators, fillers, plasticizers flameproofing agents, retarders, dyes, anti-agers and mixtures thereof, wherein said resin component is a liquid mixture of anhydrous polyols, said polyols having more than 10 carbon atoms and more than 1 hydroxyl group per molecule obtained by the reaction of an epoxy compound selected from the group consisting of epoxidized higher fatty alcohols, epoxidized higher fatty acid esters, epoxidized higher fatty acid amides, with an alcohol having a functionality of from 1 to 10, said reaction opening the epoxide ring with formation of a secondary hydroxyl group and an adjacent ether group, and optionally further reaction with C_2–C_4-alkylene oxides.

4,551,518

PROCESS FOR PRODUCTION OF POLYURETHANE

Mitsuo Matsumoto; Koji Hirai; Noriaki Yoshimura, all of Kurashiki, and Takayuki Okamura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

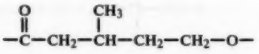
Filed Jul. 20, 1984, Ser. No. 632,921

Claims priority, application Japan, Jul. 21, 1983, 58-134100; Dec. 5, 1983, 58-230396; Mar. 19, 1984, 59-52828

Int. Cl.[4] C08G *18/42, 18/08*

U.S. Cl. 528—80 **5 Claims**

1. A process for production of polyurethane having excellent hydrolysis resistance which is obtained from a polymerized polyol having two or more hydroxyl groups in the molecule and a polyisocyanate, and optionally a chain extender, characterized in that the polymerized polyol component is a polymerized polyol having



groups in the molecule, and the amount of the reactants is such that the ratio of the number of groups of NCO in the polyisocyanate to the number of active hydrogen atoms in the polymerized polyol and the chain extender ranges from 0.8/1 to 3.0/1.0.

4,551,519

PROCESS FOR THE PRODUCTION OF FLUORINATED PYROMELLITATE CONTAINING MIXTURES USEFUL AS SURFACTANTS

Bryce C. Oxenrider, Florham Park, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 2, 1983, Ser. No. 490,593

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.[4] C08G *63/12*; C07C *67/08*

U.S. Cl. 528—296 **18 Claims**

1. A process for the production of an organic fluorinated pyromellitate-containing mixture useful as a fiber surface modifying agent wherein said process comprises:

(a) reacting pyromellitic dianhydride with fluorinated alcohol at a mole ratio of about two moles of fluorinated alcohol per mole of pyromellitic dianhydride to produce a pyromellitate having two fluorinated ester moieties and two carboxylic acid moieties; and

(b) reacting said pyromellitate of step (a) with an excess of an oxirane compound selected from the group consisting of epichlorohydrin, epibromohydrin and propylene oxide in the presence of trimellitic anhydride to produce said organic fluorinated pyromellitate-containing mixture.

4,551,520

POLYESTERS OF TRANS-4,4-STILBENEDICARBOXYLIC ACID, TEREPHTHALIC ACID AND 1,4-CYCLOHEXANEDIMETHANOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 30, 1984, Ser. No, 676,909

Int. Cl.[4] C08G *63/16*

U.S. Cl. 528—302 **6 Claims**

1. A polyester comprising repeating units from about 40 to about 95 mol % terephthalic acid, repeating units from about 5 to about 60 mol % trans-4,4'-stilbenedicarboxylic acid and repeating units from at least 60 mol % 1,4-cyclohexanedimethanol, said polyester having an inherent viscosity of 0.3 or more determined at 25° C. in 60/40 (wt/wt) phenol/tetrachloroethane at a concentration of 0.5 g/100 mL.

4,551,521
LOW-MELTING COPOLYESTER ADHESIVES

Richard L. McConnell; Abraham J. Cox, both of Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1984, Ser. No. 686,503
Int. Cl.[4] C08G *63/16*
U.S. Cl. 528—302 7 Claims

1. A linear, essentially crystalline, thermoplastic copolyester having an I.V. of about 0.4–1.2 and a melting point of about 60°–130° C., said copolyester having repeat units from about 70.5–100 mole % adipic acid, about 29.5–0mole % of a co-acid selected from the group consisting of aliphatic, cycloaliphatic and aromatic dibasic acids having 4 to 12 carbon atoms, about 70–99.5 mole % 1,4-cyclohexanedimethanol and about 30–0.5 mole % of aliphatic coglycol having 2–8 carbon atoms, said copolyester having a bonding temperature of about 90°–120° C.

4,551,522
PROCESS FOR MAKING PHOTOPOLYMERIZABLE AROMATIC POLYAMIC ACID DERIVATIVES

Michael Fryd, Haddonfield, N.J., and David L. Goff, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 26, 1985, Ser. No. 727,809
Int. Cl.[4] C08G *73/12*
U.S. Cl. 528—351 1 Claim

1. A process for the synthesis of photosensitive polyamicacid derivatives which are polyimide precursors comprising the sequential steps:

(1) forming a solution in aprotic solvent of aromatic dianhydride and monomer(s) corresponding to the formula RZH, wherein R is an ethylenically unsaturated moiety capable of addition polymerization and Z is —O—, —S— or —NR'— wherein R' is —H or C_{1-4} alkyl, the amount of monomer being 0–40 equivalent %, basis dianhydride, and maintaining the solution for a time and temperature sufficient to effect partial reaction of the aromatic dianhydride with substantially all of the monomer;

(2) admixing with and dissolving in the aromatic dianhydride-containing reaction solution of step (1) aromatic diamine while maintaining the reaction solution below 50° C. to effect condensation polymerization of the unreacted anhydride and the amine moieties to form the corresponding polyamic acid(s);

(3) admixing with and dissolving in the polyamic acid(s)-containing reaction solution of step (2) an isoimidization agent selected from the group consisting of N,N'-dihydrocarbyl-substituted carbodiimides, trifluoroacetic acid anhydride and mixtures thereof to convert the polyamic acid(s) to the corresponding polyisoimide(s);

(4) admixing with and dissolving in an aprotic solution of the polyisoimide(s) of step (3) a molar excess of monomer corresponding to the formula RZH and maintaining the solution for a time and temperature sufficient to effect substantially complete esterification of the carboxylic acid moieties of the polyisoimide(s) with monomer and converting the polyisoimide(s) to the corresponding polyamic acid derivatives; and

(5) separation of polyamic acid derivatives from the reaction solution of step (4).

4,551,523
PREPARATION OF SACCHARIDE ACETOACETATES

Edward U. Elam, and Michael L. Middleton, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,807
Int. Cl.[4] C07H *1/00*
U.S. Cl. 536—119 5 Claims

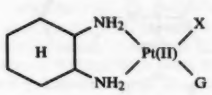
1. A process for the preparation of mono- and di-saccharide acetoacetates which comprises reacting a mono- or di-saccharide with 2,2,6-trimethyl-4H-1,3-dioxin-4-one.

4,551,524
PLATINUM COMPLEXES OF GLUCURONIC ACID

Yoshinori Kidani, and Masahide Noji, both of Nagoya, Japan, assignors to Yoshinori Kidani, Nagoya, Japan

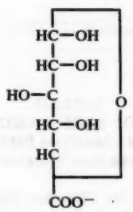
Filed Jun. 23, 1983, Ser. No. 507,243
Claims priority, application Japan, Jun. 24, 1982, 57-108925
Int. Cl.[4] C07H *11/00, 23/00*
U.S. Cl. 536—121 5 Claims

1. A platinum complex represented by the general formula (I):



(I)

wherein X is a halogen atom and G is a glucuronic acid residue of the formula:



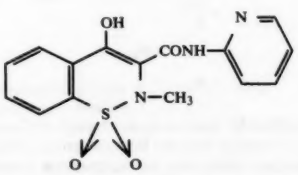
the configuration of diaminocyclohexane being selected from cis-, trans-l- and trans-d-forms.

4,551,525
PROCESS FOR PREPARING N-(2-PYRIDYL)-2-METHYL-4-HYDROXY-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE-1,1-DIOXIDE

Natasa Zupancic; Boris Sket, both of Ljubljana; Pavel Zupet, Novo mesto, and Marko Zupan, Ljubljana, all of Yugoslavia, assignors to KRKA, tovarna zdravil, n.sol.o., Novo mesto, Yugoslavia

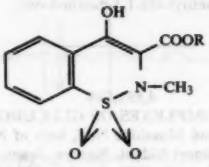
Filed Oct. 2, 1984, Ser. No. 656,850
Claims priority, application Yugoslavia, Oct. 6, 1983, 2021/83
Int. Cl.[4] C07D *401/12*
U.S. Cl. 544—49 8 Claims

1. A process for preparing N-(2-pyridyl)-2-methyl-4-hydroxy-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxide of formula I



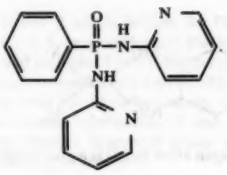
I

characterized in that alkyl-4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylate-1,1-dioxide of the formula II



II

wherein R represents an alkyl group of 1 to 4 carbon atoms, is reacted with P-phenyl-N,N'-di-2-pyridyl-phosphonium diamide of the formula III



III

4,551,526

SYNTHESIS OF ALPHA-AMINONITRILES

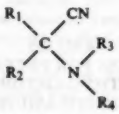
Khuong H. X. Mai, and Ghanshyam Patil, both of Vernon Hills, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 26, 1984, Ser. No. 654,430

Int. Cl.[4] C07D *295/14;* C07C *121/78*

U.S. Cl. 544—163 **6 Claims**

1. A process of preparing an alpha-aminonitrile of the formula



wherein R_1, R_2, R_3 and R_4 are each independently hydrogen, C_1–C_{20} alkyl, C_3–C_{12} cycloalkyl, C_7–C_{15} aralkyl, a phenyl or naphthyl group which may be unsubstituted or substituted with loweralkyl of from 1 to 6 carbon atoms, halo, hydroxy, amino, nitro, loweralkoxy, carboxy, loweralkanoyl, or loweralkoxy-carbonyl, thiophene, furan, pyridine or imidazole, or R_1 and R_2 together with the carbon atom to which they are attached form a 6 member cycloalkyl group, which process comprises:

reacting a compound of the formula

with trimethylsilyl cyanide in the presence of a catalytic amount of a catalyst selected from the group consisting of an alkali metal iodide, zinc iodide, quaternary ammonium iodide or ammonium chloride, and subsequently reacting the alpha-trimethylsilyloxynitrile so formed with an amine selected to produce the desired alpha-aminonitrile.

4,551,527

SALTS OF 5,5-BIS-(BROMOMETHYL)-2-HYDROXY-2-OXO-1,3,2-DIOXAPHOSPHORINANE AND PROCESS FOR PREPARING SAME

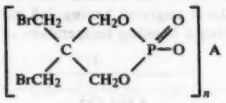
Yuval Halpern, Skokie, and Donna Mott, Des Plaines, both of Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Jul. 2, 1981, Ser. No. 279,636

Int. Cl.[4] C07F *9/65, 9/15*

U.S. Cl. 544—214 **13 Claims**

1. A salt of 5,5-bis-(bromomethyl)-2-hydroxy-2-oxo-1,3,2-dioxaphosphorinane having the structure:



where A is a metal or amine group and n is 1–3.

5. The salt of claim 1 wherein A is magnesium.

7. A process for preparing salts of 5,5-bis-(bromomethyl)-2-hydroxy-2-oxo-1,3,2-dioxaphosphorinane comprising reacting (1) 5,5-bis-(bromomethyl)-2-chloro-2-oxo-1,3,2-dioxaphosphorinane with (2) a water-soluble metal salt or an amine, in the presence of water, to form the corresponding salt of 5,5-bis-(bromomethyl)-2-hydroxy-2-oxo-1,3,2-dioxaphosphorinane, and isolating said salt from the process mixture.

4,551,528

CARRYING OUT ORGANIC CONDENSATION REACTIONS AT ELEVATED TEMPERATURES BY FEEDING THE STARTING MATERIALS INTO THE BOTTOM OF A REACTOR CHARGED WITH MINERAL OIL FOLLOWED BY PRODUCT DISTILLATION

Toni Dockner, Meckenheim, and Herbert Krug, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,442

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245109

Int. Cl.[4] C08G *12/06*

U.S. Cl. 544—242 **11 Claims**

1. A method of carrying out organic condensation reactions at elevated temperatures, wherein the starting material or materials are fed in, in gaseous form, at the bottom of a reactor charged with mineral oil having a boiling point of not less than 150° C., or are fed in, in liquid form, at the bottom of the reactor charged with mineral oil, and the mineral oil is kept at a temperature which is sufficiently high for the starting materials introduced as liquids at the bottom of the reactor to vaporize, and the product is obtained by distillation.

4,551,529

GUANINE-N[7]-OXIDE

Donald L. Kern, Dearborn; Gerard C. Hokanson, and James C. French, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 6, 1983, Ser. No. 539,517

Int. Cl.[4] C07D *473/18;* A61K *31/52;* C12P *17/18;* C12R *1/04*

U.S. Cl. 544—265 **5 Claims**

1. The compound 2-amino-1,9-dihydro-6H-purin-6-one-7-oxide and its tautomers and the pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition for treating microbial infections in a mammal comprising an antimicrobially effective amount of a compound defined by claim 1 together with a pharmaceutically acceptable carrier.

4,551,530

PYRIDYL IMIDAZO[1,2-A]PYRIMIDINES

John P. Dusza, and Jay D. Albright, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 19, 1984, Ser. No. 672,753

Int. Cl.[4] C07D *487/04;* A61K *31/505*

U.S. Cl. 544—281 **2 Claims**

1. The compound, 5-(3-pyridyl)imidazo[1,2-a]pyrimidine or a nontoxic pharmaceutically acceptable salt thereof.

2. The compound, 5-(4-pyridyl)imidazo[1,2-a]pyrimidine or a nontoxic pharmaceutically acceptable salt thereof.

4,551,531

4-DIFLUOROMETHOXY-2-AMINO-PYRIMIDINES

Willy Meyer, Riehen; Karl Gass, Magden; Werner Töpfl, Dornach; Rolf Schurter, Binningen, all of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

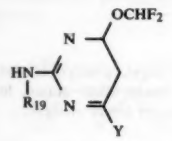
Division of Ser. No. 455,175, Jan. 3, 1983, Pat. No. 4,478,635. This application Jul. 26, 1984, Ser. No. 641,140

Claims priority, application Switzerland, Jan. 11, 1982, 124/82; Sep. 2, 1982, 5224/82

Int. Cl.[4] C07D *239/47*

U.S. Cl. 544—320 **4 Claims**

1. A compound of the formula



wherein

Y is C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, C_2–C_3 alkoxyalkyl, C_1–C_3 alkylthio, halogen or $—NR_{16}R_{17}$,

each of R_{16} and R_{17} is hydrogen or C_1–C_4 alkyl, and R_{19} is C_1–C_3 alkyl or C_1–C_3 alkoxy.

4,551,532

ETHYLENE GLYCOL DERIVATIVES HAVING ANTI-PROTOZOAN, ANTI-FUNGAL AND ANTI-TUMOR ACTIVITY

Motoo Hozumi, Omiya; Hiroaki Nomura, Takatsuki, and Yoshio Yoshioka, Kitakatsurag, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

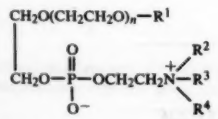
Filed Apr. 27, 1981, Ser. No. 257,771

Claims priority, application Japan, May 8, 1980, 55-61463; Feb. 20, 1981, 56-24460

Int. Cl.[4] C07F *9/40, 9/58, 9/60, 9/65*

U.S. Cl. 546—22 **12 Claims**

1. A compound of the formula:



wherein

n is an integer of 1 to 15;

R^1 is C_{6-26} alkyl, C_{6-26} alkenyl or C_{6-26} alkynyl, each of said groups being unsubstituted or substituted by hydroxyl, mercapto, amino, oxo, carbamoyl, carboxyl, halogen, C_{3-7} cycloalkyl or phenyl; and

R^2, R^3 and R^4 are independently hydrogen or C_{1-5} alkyl, or

represents cyclic ammonio selected from the group consisting of pyridinio, oxazolio, thiazolio, pyridazinio, quinolinio, isoquinolinio, N-C_{1-4} alkylmorpholinio and N-C_{1-4} alkylpiperazinio, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, hydroxyl, hydroxyethyl, aminoethyl, amino, carbamoyl or ureido,

or a pharmaceutically acceptable salt thereof.

4,551,533

ANTIBIOTIC LL-D42067α

Taikwang M. Lee, Holmdel, N.J.; Donald B. Borders, Suffern; Joseph J. Goodman, Spring Valley, both of N.Y.; Raymond T. Testa, Cedar Grove; William M. Maiese, Bridgewater, both of N.J., and David P. Labeda, Peoria, Ill., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 26, 1984, Ser. No. 593,160

Int. Cl.[4] C07D *521/00;* C12P *17/18;* C12R *1/03;* C12N *1/20*

U.S. Cl. 546—35 **1 Claim**

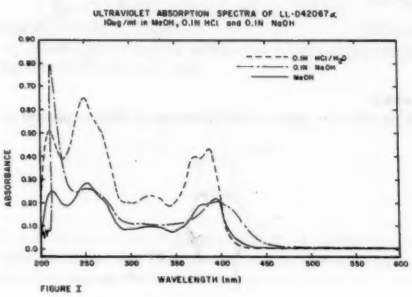
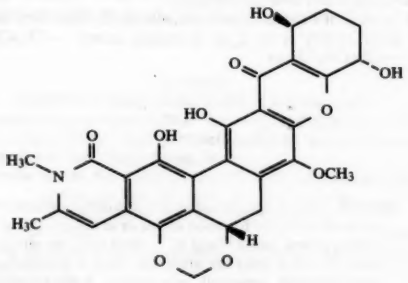


FIGURE I

1. The compound designated as LL-D42067α, wherein the compound has:

(a) the relative stereochemistry and structure:



(b) a molecular weight of 535 (FAB-MS);

(c) a molecular formula: $C_{28}H_{25}NO_{10}$;

(d) a specific optical rotation: $[\alpha]_D^{26} = +836^+ - 40°$ (C 0.3, DMF);

(e) characteristic ultraviolet absorption spectra as shown in Figure I of the attached drawings;

(f) a characteristic infrared absorption spectrum as shown in FIG. II of the attached drawings;

(g) a characteristic proton nuclear magnetic resonance spectrum as shown in FIG. III of the attached drawings;
(h) a characteristic carbon-13 nuclear magnetic resonance spectrum as shown in FIG. IV of the attached drawings with significant peaks at: 20.4; 25.4; 25.8; 29.0; 30.4; 58.5; 61.6; 63.3; 71.7; 90.4; 100.0; 109.2; 109.7; 111.0; 113.7; 119.0; 125.8; 126.6; 134.9; 135.3; 136.1; 141.3; 147.9; 151.1; 152.5; 165.4; 165.6; 182.3; and
(i) a characteristic proton to carbon-13 chemical shift correlation as shown in Figure V of the attached drawings.

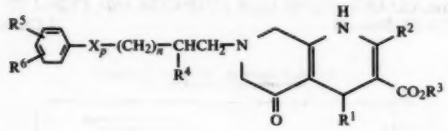
4,551,534

ARALKYL OR ARYLOXYALKYL 1,7-NAPHTHYRIDINE-3-CARBOXYLIC ACID ESTERS

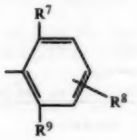
Theodore S. Sulkowski, Wayne; Paul J. Silver, West Chester; Albert A. Mascitti, Norristown, and Reinhold H. W. Bender, Valley Forge, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,168
Int. Cl.[4] C07D *471/02*
U.S. Cl. 546—123 **13 Claims**

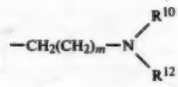
1. A compound of the formula:



in which
R^1 is tetra- or penta- chloro, bromo or fluoro- phenyl or



where R^7 and R^9 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, halo, trifluoromethyl, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, cyano or nitro and R^8 is hydrogen, alkyl of 1 to 6 carbon atoms, halo, trifluoromethyl, cyano or nitro;
R^2 is alkyl of 1 to 6 carbon atoms;
R^3 is alkyl of 1 to 6 carbon atoms, alkoxyalkyl in which each alkyl moiety is of 1 to 6 carbon atoms, $—CH_2CF_3$, $—CH_2CH_2CF_3$ or



where R^{10} is hydrogen or alkyl of 1 to 6 carbon atoms; and R^{12} is alkyl of 1 to 6 carbon atoms or arylalkyl of 7 to 10 carbon atoms, and R^{10} and R^{12}, taken with the nitrogen atom to which they are attached, form a pyrrolidinyl, imidazolidinyl, piperidyl, piperazinyl, 4-alkylpiperazinyl, in which the alkyl group contains from 1 to 6 carbon atoms, or morpholinyl heterocycle; and m is one of the integers 0, 1 or 2;
R^4 is hydrogen, hydroxy or alkyl of 1 to 3 carbon atoms;
R^5 and R^6 are, independently, hydrogen, —Cl, —Br, —F, trifluoromethyl, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;
X is —O—, or —S—,
n is one of the integers 0, 1, 2 or 3; and
p is one of the integers 0 or 1, with the proviso that when n is 0, p is 0 and R^4 is hydroxy;
or a pharmaceutically acceptable salt thereof.

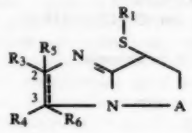
4,551,535

PROCESS FOR PREPARING NOVEL 7-THIOESTER DERIVATIVES OF 3H PYRROLO [1,2-a]-IMIDAZOLE AND 8-THIOESTER DERIVATIVES OF IMIDAZO [1,2-a] PYRIDINE

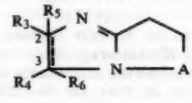
Thomas A. Davidson, and Robert J. Murray, both of Penfield, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 518,514, Jul. 29, 1983, Pat. No. 4,507,481. This application Nov. 26, 1984, Ser. No. 675,053
Int. Cl.[4] C07D *247/02*
U.S. Cl. 546—121 **2 Claims**

1. A process for preparing the compound



wherein: R_1 is hydrogen, lower alkyl, phenyl, benzyl, or phenyl or benzyl substituted by lower alkyl, amino, lower alkylamino, nitro, halogen, hydroxy or lower alkoxy;
A is CH_2 or CH_2CH_2;
R_3 and R_4 are independently selected from hydrogen, lower alkyl, phenyl or phenyl substituted with lower alkyl, amino, lower alkylamino, nitro, hydroxy, lower alkoxy or halogen, provided that at least one of R_3 and R_4 is phenyl or substituted phenyl; and
R_5 and R_6 are each hydrogen or join to form a double bond at the 2,3-position,
and pharmaceutically acceptable addition salts thereof, which process comprises contacting the corresponding amidine compound



wherein A, R_3, R_4, R_5, and R_6 are as described above with about one molar equivalent of R_1SSR_1 in the presence of about two molar equivalents of a base and at a temperature of from about −78° C. to about 0° C., and recovering from the resultant reaction mixture the desired monosulfenylated amidine.

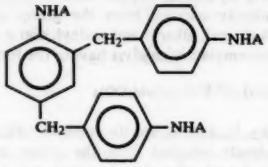
4,551,536

BIS-(P-AMINO-HETEROARYLMETHYL)ANILINES AS ANTIOXIDANTS

John T. Roberts, Metuchen, N.J., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 338,444, Jan. 8, 1982, Pat. No. 4,411,805. This application Jul. 15, 1983, Ser. No. 514,370
Int. Cl.[4] C07D *401/14*
U.S. Cl. 546—264 **4 Claims**

1. Compounds of the structure



where A is selected from the group consisting of heteroarylmethyl moieties of the formula $-CH_2X$, where X is a monovalent radical whose parent is a heteroaromatic ring selected from the group consisting of pyridine, thiophene, pyrrole, furan, imidazole, oxazole, thiazole, quinoline, and carbazole.

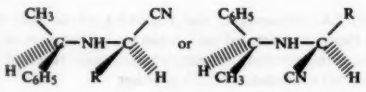
4,551,537

SYNTHESIS OF ALPHA-AMINONITRILES

Khuong H. X. Mai, and Ghanshyam Patil, both of Vernon Hills, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

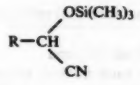
Filed Sep. 26, 1984, Ser. No. 654,429
Int. Cl.[4] C07D *213/55;* C07C *121/78*
U.S. Cl. 546—330 **5 Claims**

1. A process for preparing an optically active compound of the formula

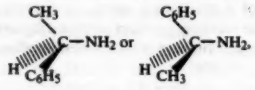


(R,R) (S,S)

wherein R is C_1–C_{20} alkyl, C_3–C_{12} cycloalkyl, C_7–C_{15} aralkyl or a phenyl or naphthyl group which may be unsubstituted or substituted with loweralkyl of from 1 to about 6 carbon atoms, halo, hydroxy, amino, nitro, lower alkoxy, carboxy lower alkanoyl, or lower alkoxycarbonyl, or a pyridyl, thienyl, furyl or pyrrolyl group, which process comprises: reacting in an inert medium, a compound of the formula



with an optically active compound of the formula



R S

respectively at a temperature and for a time sufficient to complete the reaction between said compounds.

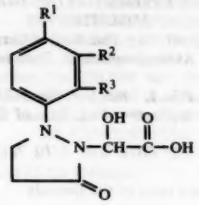
4,551,538

PHENYLPYRAZOLIDINE ACETIC ACID DERIVATIVES

Peter H. L. Wei, Springfield, and Richard P. Carlson, Lansdale, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 20, 1984, Ser. No. 683,977
Int. Cl.[4] C07D *231/08*
U.S. Cl. 548—367 **6 Claims**

1. A compound having the formula



wherein

R^1 is hydrogen, lower alkyl, trifluoromethyl or halo;

R^2 is hydrogen, trifluoromethyl or halo; and

R^3 is hydrogen, nitro or carboxy.

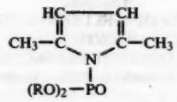
4,551,539

SUBSTITUTED 2,5-DIMETHYLPYRROLES

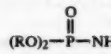
Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 458,602, Jan. 17, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,641
Int. Cl.[4] C07D *207/327, 207/36, 207/30*
U.S. Cl. 548—412 **3 Claims**

1. A process for preparing substituted 2,5-dimethylpyrroles having the molecular structure:



wherein R is alkyl or aralkyl and contains 1–19 carbon atoms, said process comprising reacting acetonylacetone with a phosphoramidate having the molecular structure:



wherein R is alkyl or aralkyl of 1–19 carbon atoms in a water-immiscible solvent at a temperature of between 75° and 200° C. in the presence of an acidic catalyst, removing water and isolating the said substituted 2,5-dimethylpyrrole.

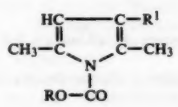
4,551,540

SUBSTITUTED 2,5-DIMETHYLPYRROLES

Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Division of Ser. No. 458,602, Jan. 17, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,640
Int. Cl.[4] C07D *207/327, 207/36, 207/30*
U.S. Cl. 548—531 **8 Claims**

1. A substituted 2,5-dimethylpyrrole having the molecular structure:



wherein R is alkyl or aralkyl and contains 1–19 carbon atoms, and R^1 is hydrogen or carboalkoxy having 2–5 carbon atoms.

4,551,541

ORGANOSILANE ESTERS HAVING GLYCOL ETHER MOIETIES

Horst Hanisch, Hennef/Sieg, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,863

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203688

Int. Cl.⁴ C07F *7/08, 7/10, 7/18*

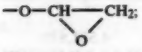
U.S. Cl. 549—215 **12 Claims**

1. An organosilane ester of the formula

$$Y-(CH_2)_n-Si(CH_3)_mX_pZ_{3-(m+p)}$$

wherein

Y is —SH;



the grouping —NH—$(CH_2)_2$—NH—$(CH_2)_2$—NH_2; or NHR where R is H, C_{1-6} alkyl, phenyl or —$(CH_2)_2$—NH_2

X is —OCH_3, —OC_2H_5 or —OC_3H_7,

Z is —O—$(CH_2$—$CH_2O)_q$—R' where q is 2 or 3 and R' is an alkyl of 1 to 4 carbon atoms and one of the H-atoms can be substituted by a methyl group, and

m is 0, 1 or 2; n is 1,2 or 3; and p is 0 or 1; with the proviso that m+p are equal to 0, 1 or 2.

4,551,542

REGENERATION OF 6-FLUORO-4-CHROMANONE FROM 6-FLUORO-4-UREIDOCHROMAN-4-CARBOXYLIC ACID

Bernard S. Moore, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 26, 1984, Ser. No. 655,006

Int. Cl.⁴ C07D *311/68*

U.S. Cl. 549—401 **11 Claims**

1. A process for the regeneration of 6-fluoro-4-chromanone from (R)-6-fluoro-4-ureidochroman-4-carboxylic acid or a mixture of (R)- and (RS)-6-fluoro-4-ureidochroman-4-carboxylic acid, which comprises:

reacting said (R)-6-fluoro-4-ureidochroman-4-carboxylic acid or mixture of (R)- and (RS)-6-fluoro-4-ureidochroman-4-carboxylic acid with a metal permanganate, in an aqueous or partially aqueous solvent system, at a temperature in the range from 10° to 70° C., and at a pH in the range from 3.0 to 7.0.

4,551,543

BIMETALLIC CARBONYL HYDROFORMYLATION CATALYSTS

Gerald Doyle, Whitehouse Station; Kenneth A. Eriksen, Phillipsburg, both of N.J., and Roy L. Pruett, Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 21, 1983, Ser. No. 563,971

Int. Cl.⁴ C07F *1/08, 15/00, 15/06*

U.S. Cl. 556—14 **28 Claims**

1. A hydroformylation catalyst having the structural formula:

$$T_aCuM(CO)_4$$

where L is a monodentate or bidentate phosphine, a is 1–3 and M is cobalt or rhodium.

11. The catalyst according to claim 1 wherein the bidentate phosphine is a compound having the formula

$$[R_1R_2Q(CH_2)_nQR_3R_4]$$
$$R_1R_2P(CH_2)_nPR_3R_4$$

wherein R_1, R_2, R_3 and R_4 are the same or different and are each independently selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl; and n is 1–4.

20. A hydroformylation catalyst having the formula

$$(R_1R_2N(CH_2)_nNR_3R_4)_aCuM(CO)_4$$

wherein R_1, R_2, R_3 and R_4 are the same or different and are each independently selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl; n is 1–4; a is 1–3; and M is cobalt or rhodium.

4,551,544

TITANIUM ESTER COMPOSITIONS HAVING DEPRESSED FREEZING POINTS

Gordon B. Robbins, Edison, Nebr., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 439,567, Nov. 5, 1982, abandoned. This application Aug. 21, 1984, Ser. No. 642,813

Int. Cl.⁴ C07F *7/28*

U.S. Cl. 556—40 **18 Claims**

1. A composition comprising the reaction product obtained by reacting (i) a titanate represented by the empirical formula

$$(R^1O)_4Ti$$

with (ii) 2,4-pentanedione and removing all or part of the R^1OH thereby generated and replacing all or part of it by combining the resulting titanate/pentanedione reaction product with (iii) a substance which is either

(a) at least one other titanate represented by the empirical formula

$$(R^2O)_4Ti$$

or

(b) at least one alcohol represented by the empirical formula

$$R^3OH$$

wherein

the titanate:pentanedione mol ratio is in the range between 1:1 and 1:2;

R^2 and R^3 differ from R^1; and

R^1, R^2 and R^3 are each methyl, ethyl, 2-chloroethyl, isopropyl, n-propyl, n-butyl, n-pentyl, 2-pentyl, 3-methylbutyl, 2-methoxyethyl, or methoxyethoxyethyl;

the quantity of said substance being sufficient, even in the presence of a nucleating agent, to depress the freezing point of the reaction product obtained by combining said first-mentioned titanate with 2,4-pentanedione.

4,551,545

PROCESS OF PREPARING ALKYL CIS CHRYSANTHEMATES

Michel Frank-Neumann, Strasbourg; Madjid Sedrati, Osthoffen; Jean-Pierre Vigneron, Boissy-sous-Saint-Yon, and Vincente Bloy, Paris, all of France, assignors to Roussel Uclaf, Paris, France

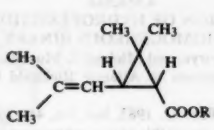
Filed Jul. 18, 1984, Ser. No. 632,203

Claims priority, application France, Jul. 21, 1983, 83 12073

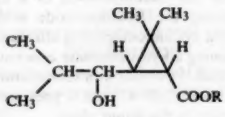
Int. Cl.⁴ C07C *69/747*

U.S. Cl. 560—124 **3 Claims**

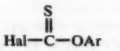
1. A process for the preparation of racemic or optically active isomers of alkyl esters of cis chrysanthemic of the formula



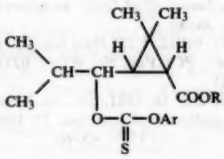
wherein R is alkyl of 1 to 6 carbon atoms comprises reacting a racemic or optically active cis compound of the formula



wherein R has the above definition with an aryl halothioformate of the formula



wherein Hal is a halogen and Ar is aryl of 6 to 12 carbon atoms optionally substituted with at least one alkyl of 1 to 3 carbon atoms to obtain a compound of the formula



of cis configuration and heating the latter at 100° to 150° C. in a non-polar organic solvent to obtain the compound of formula I.

4,551,546
HALOGENATED ESTERS

Nazim Punja, Crowthorne, England, assignor to Imperial Chemical Industries PLC, London, England

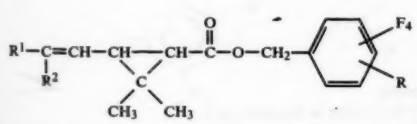
Continuation of Ser. No. 339,733, Jan. 15, 1982, , which is a division of Ser. No. 211,943, Dec. 1, 1980, Pat. No. 4,405,640. This application Nov. 14, 1983, Ser. No. 551,697

Claims priority, application United Kingdom, Dec. 21, 1979, 7944151; Nov. 20, 1980, 8037257

Int. Cl.⁴ A01N *53/00*; C07C *69/74*

U.S. Cl. 560—124 **4 Claims**

1. A compound of formula:



where R^1 and R^2 are both halo or both methyl and R is methyl, ethyl, allyl, methoxy, ethoxy or allyloxy.

4,551,547
BIOCIDAL 2-ARYL-1, 3-CYCLOPENTANEDIONE ENOL ESTER COMPOUNDS

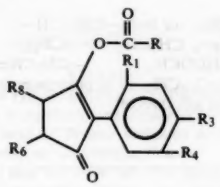
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 205,650, Nov. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 944,996, Sep. 22, 1978, abandoned. This application Sep. 2, 1983, Ser. No. 528,936

Int. Cl.⁴ C07C *67/02*

U.S. Cl. 560—255 **7 Claims**

1. A compound of the formula:



wherein:

R is C_1–C_{15} linear alkyl, C_1–C_{15} branched alkyl or phenyl;

R_1 is alkyl or halogen;

R_3 and R_4 are individually hydrogen, alkyl or halogen;

R_6 is hydrogen alkyl or alkylene; and

R_8 is hydrogen or R_6 and R_8 together form a six-membered alkylene ring.

4,551,548
PROCESS FOR THE RECOVERY OF S-(CARBOXYMETHYL)-(R)-CYSTEINE AND S-(CARBOXYMETHYL)-(S)-CYSTEINE

Axel Kleemann, Hanau; Jürgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,514

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211127

Int. Cl.⁴ C07B *19/00*

U.S. Cl. 562—402 **15 Claims**

1. A process for obtaining purified S-(carboxymethyl)-(R)-cysteine and purified S-(carboxymethyl)-(S)-cysteine from a mixture of the two enantioners comprising dissolving the mixture of the two enantiomers in water in the presence of sufficient ammonia that the solution of ammonium salts formed has a pH between 6 and 9, bringing about in the solution of ammonium salts a state of supersaturation by the addition of seeding crystals of the ammonium salt of one of the two enantiomers, crystallizing one of the two enantiomers, separating off the crystals, adding seeding crystals of the ammonium salt of the other enantiomer to the remaining mother liquor to crystallize the ammonium salt of this other enantiomer, separating off the precipitated crystals and finally setting free from the ammonium salts the respective S-(carboxymethyl)-cysteines.

4,551,549
PREPARATION AND USE OF NITROTEREPHTHALAMIC ACIDS

George N. Milford, Jr., Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 293,329, Aug. 17, 1981, Pat. No. 4,399,303. This application Apr. 18, 1983, Ser. No. 485,942

Int. Cl.⁴ C07C *102/06*

U.S. Cl. 562—437 **3 Claims**

1. Process for the preparation of nitroterephthalamic acids by reaction of 1–4 carbon dialkyl nitroterephthalate with 20–51% by weight aqueous ammonia under at least autogenous pressure at 100°–200° C. for 1–6 hours at a dialkyl nitroterephthalate concentration of 10–40% by weight.

4,551,550
N-2,3-BUTADIENYL-1,4-BUTANEDIAMINE DERIVATIVES

Philippe Bey, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Dec. 17, 1984, Ser. No. 682,396
Int. Cl.[4] C07C *103/127, 87/24*
U.S. Cl. 564—215 **17 Claims**

1. A compound of the formula:

$$H_2C{=}C{=}CHCH_2NHCH_2{-}Z{-}CH_2NHR$$

wherein:

Z is $-CH_2CH_2-$ or trans—CH=CH—,

R is H, CH_3-, CH_3CH_2, $CH_3(CH_2)_2-$, $-(CH_2)_3NH_2$, $-(CH_2)_3NHCOCH_3$, $-CH_2CH{=}CH_2$, or $-CH_2CH{=}C{=}CH_2$, or a pharmaceutically acceptable acid addition salt thereof.

4,551,551
PREPARATION OF BIS(AMINOPHENYL) ETHERS FROM (N-ACETYL)AMINOPHENOLS OR THEIR PHENOLATES

Ervin B. Inskip, Troy, Ill., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Sep. 27, 1982, Ser. No. 424,134
Int. Cl.[4] C07C *85/00*
U.S. Cl. 564—430 **16 Claims**

1. A process for preparing a high-purity substantially colorless bis(aminophenyl)ether product which comprises (a) effecting condensation reaction of an (N-acetyl)aminophenol or the corresponding (N-acetyl)aminophenate with a halonitrobenzene under condensation reaction conditions to form an (N-acetyl)aminophenyl nitrophenyl ether, said conditions comprising refluxing a liquid reaction mixture comprising (i) a dipolar aprotic solvent, (ii) said (N-acetyl)aminophenol or said (N-acetyl)aminophenate, and (iii) said halonitrobenzene, (b) separating said (N-acetyl)aminophenyl nitrophenyl ether from said liquid reaction mixture and forming a dispersion of the last-mentioned ether in a lower aliphatic alcoholic solvent therefor, (c) hydrogenating the nitro group of said ether in said dispersion under nitro-group hydrogenation conditions to form an (N-acetyl)-bis-(aminophenyl)ether, (d) hydrolyzing the (N-acetyl)-bis-(aminophenyl)ether with aqueous mineral acid under acid hydrolysis conditions to form an acidic aqueous dispersion of the bis-(aminophenyl)ether product, and (e) recovering said bis-(aminophenyl)ether product from said aqueous dispersion.

4,551,552
PROCESS FOR PREPARING RIMANTADINE

John J. Liu, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 23, 1984, Ser. No. 613,374
Int. Cl.[4] C07C *85/11*
U.S. Cl. 564—448 **6 Claims**

1. In a process for the preparation of rimantadine by the reduction of 1-adamantyl methyl ketoxime, the improvement comprising reducing the ketoxime by contacting a solution of the ketoxime with hydrogen in the presence of a platinum on carbon catalyst at a temperature in the range of about 10°–60° C. and a pressure of about 25 to 215 psia (170–1500 KPa).

4,551,553
DECOMPOSITION OF HYDROPEROXIDES IN THE PRESENCE OF HOMOGENEOUS BINARY CATALYSTS

Paul D. Taylor, Berwyn, and Michael T. Mocella, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 22, 1983, Ser. No. 468,261
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Int. Cl.[4] C07C *45/53, 37/08*
U.S. Cl. 568—311 **16 Claims**

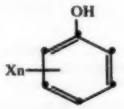
1. A process for the decomposition of a hydroperoxide comprising contacting the hydroperoxide with a catalytic quantity of a catalyst system comprising chromium and ruthenium while maintaining a hydroperoxide concentration during the reaction of at least 1 percent at a temperature of between about 25° C. and about 250° C. and a pressure sufficient to maintain the reactants in the liquid phase.

4,551,554
PROCESS FOR PRODUCTION OF 2-HALOACETYLPHENOLS

Tsutomu Sugasawa, Kobe; Tatsuo Toyoda, Osaka, and Kazuyuki Sasakura, Omihachiman, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00012, § 371 Date Sep. 23, 1981, § 102(e) Date Sep. 23, 1981, PCT Pub. No. WO81/02157, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 16, 1981, Ser. No. 305,621
Claims priority, application Japan, Jan. 23, 1980, 55-7148
Int. Cl.[4] C07C *45/46*
U.S. Cl. 568—322 **1 Claim**

1. A process for production of 2-haloacetylphenols which comprises reacting a phenol having the formula



wherein,

X is hydrogen, C_1–C_5 alkyl, C_3–C_6 cycloalkyl, C_1–C_5 alkoxy or a halogen atom, and

n is an integer of 0–2

with a haloacetonitrile having the formula

$$CN{-}CH_mY_{3-m}$$

wherein,

Y is chlorine or bromine and

m is an integer of 0–2

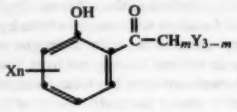
and a boron halide compound having the formula

wherein,

R is chlorine or bromine, and

R' is chlorine, bromine, C_{1-C5} alkyl or phenyl

in the presence of a Lewis acid to give a compound having the formula



wherein, X, Y, m and n are as defined above.

4,551,555

PROCESS FOR THE PRODUCTION OF CARBONYL COMPOUNDS

Yoshio Hironaka, Sodegaura, and Takashi Kumazawa, Kisarazu, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,594

Claims priority, application Japan, Jun. 15, 1983, 58-105945

Int. Cl.[4] C07C *45/35*

U.S. Cl. 568—401 **25 Claims**

1. In the process for producing a carbonyl compound by contacting olefin and oxygen or oxygen-containing gas with a catalyst in the presence of water, the improvement which comprises using a catalyst comprising a carrier and (a) rhodium, (b) manganese and (c) a Group IIIA element excluding the actinium series elements.

4,551,556

PROCESS FOR PRODUCING CARBONYL COMPOUNDS

Eiichiro Nishikawa; Masuo Shinya, both of Saitama; Kayako Ueda, Tokyo, and Katsumi Kaneko, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,544

Claims priority, application Japan, May 2, 1983, 58-76173

Int. Cl.[4] C07C *45/00*

U.S. Cl. 568—403 **8 Claims**

1. A process for producing a carbonyl compound which comprises dehydrogenating a linear aliphatic alcohol of 1 to 6 carbon atoms in the gas phase at a temperature of from 150° to 400° C. in the presence of a ruthenium catalyst supported on a carrier comprising a basic oxide selected from the group consisting of zinc oxide, magnesium oxide, calcium oxide and barium oxide.

4,551,557

BROMINATION OF SUBSTITUTED BENZALDEHYDES

Serge Ratton, La Verpilliere, and Jean-Luc Bougeois, Sainte-Foy les Lyon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

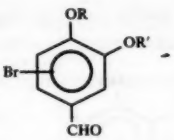
Filed Dec. 24, 1984, Ser. No. 685,372

Claims priority, application France, Dec. 22, 1983, 83 20797

Int. Cl.[4] C07C *45/63*

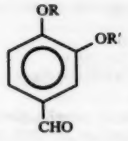
U.S. Cl. 568—433 **13 Claims**

1. A process for the preparation of a substituted bromobenzaldehyde having the general formula:



(I)

wherein R and R′ are each hydrogen, methyl or ethyl, comprising brominating a substituted benzaldehyde having the general formula:



(II)

wherein R and R′ are as defined above, with a brominating agent couple which comprises hydrobromic acid and a bromide ion oxidizer.

4,551,558

BROMINATION OF SUBSTITUTED BENZALDEHYDES

Serge Ratton, La Verpilliere, and Jean-Luc Bougeois, Sainte-Foy les Lyon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

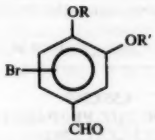
Filed Dec. 24, 1984, Ser. No. 685,373

Claims priority, application France, Dec. 22, 1983, 83 20798

Int. Cl.[4] C07C *45/63*

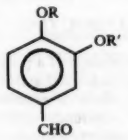
U.S. Cl. 568—433 **17 Claims**

1. A process for the preparation of a substituted bromobenzaldehyde having the general formula:



(I)

wherein R and R′ are each hydrogen, methyl or ethyl, comprising (i) first brominating a substituted benzaldehyde having the general formula:



(II)

wherein R and R′ are as defined above, with a less than stoichiometric amount of bromine, and (ii) completing said bromination reaction with a brominating agent couple which comprises (1) the hydrobromic acid generated in situ in the step (i) and (2) a bromide ion oxidizer.

4,551,559

HYDROFORMYLATION CATALYST AND PROCESS

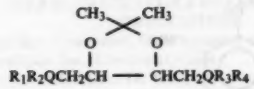
Chao-Yang Hsu, Media, and Paul E. Ellis, Jr., Downingtown, both of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Division of Ser. No. 598,934, Apr. 11, 1984,. This application May 9, 1985, Ser. No. 732,314

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **11 Claims**

1. In the process of hydroformylating an olefin having from about 2 to 20 carbon atoms by reacting the olefin with hydrogen and carbon monoxide at elevated pressures in the presence of a catalyst to produce an aldehyde, the improvement of using as the catalyst a catalyst system which comprises (1) a platinum (II) (acetylacetonate)$_2$; (2) a Group IVB metal halide; and (3) a bidentate tertiary ligand of the formula:



wherein Q is arsenic, antimony, or phosphorus; and R_1, R_2, R_3 and R_4 are alkyl, aryl, alkoxyl, or aryloxyl groups, and may be the same or different.

4,551,560

THERMALLY-INDUCED HYDROLYSIS OF ACETAL

Nabil M. Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Nov. 9, 1984, Ser. No. 669,708

Int. Cl.[4] C07C *45/51, 47/02*

U.S. Cl. 568—465 **11 Claims**

1. A process for the selective-thermally induced hydrolysis of acetals to the corresponding lower non aromatic aldehydes and alcohols of about 2 to 6 carbon atoms, comprising:

forming a substantially catalyst-free, acetal-containing solution;

heating and pressurizing the acetal-containing solution to a temperature above about 140° C. and a corresponding pressure ranging from about 50–5000 psia to effect the substantial hydrolysis of the acetal present in the solution to the corresponding non aromatic aldehyde and alcohol of about 2 to 6 carbon atoms; the reaction occurring in a suitable amount of water;

removing the resultant liquid solution as product.

4,551,561

PROCESS FOR THE PREPARATION OF POLYGLYCEROLS

Herbert Stühler, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,376

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346097

Int. Cl.[4] C07C *41/01*

U.S. Cl. 568—619 **6 Claims**

1. A process for the preparation of a polyglycerol, in which glycerol is reacted in the presence of catalysts at a temperature from 190° to 250° C., the water of reaction being removed, which comprises using compounds containing phosphorus individually or as mixtures and compounds containing an alkali metal individually or as mixtures as the catalyst such that the phosphorus is present in an amount of 0.005 to 1% by weight, based on the weight of glycerol, and the molar ratio of alkali metal to phosphorus is 1 to 12:1, the compounds containing phosphorus and an alkali metal being selected from the group consisting of reducing phosphorus acids, alkali metal salts of reducing phosphorus acids, alkali metal hydroxides, alkali metal carbonates, alkali metal bicarbonates, alkali metal alcoholates and alkali metal oxides.

4,551,562

PROCESS FOR THE PRODUCTION OF DIHYDROXYBENZENES

Karlheinz Drauz, Freigericht, and Axel Kleemann, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

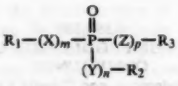
Continuation-in-part of Ser. No. 588,847, Mar. 12, 1984,. This application Mar. 13, 1984, Ser. No. 588,999

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308726

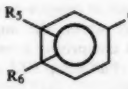
Int. Cl.[4] C07C *37/60, 41/26*

U.S. Cl. 568—771 **42 Claims**

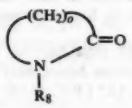
1. A process for the production of a nuclear hydroxylated product comprising reacting phenol per se, chlorophenol, fluorophenol, 1 to 4 carbon alkyphenol, carbomethoxyphenol, cyclohexyphenol, phenylphenol or naphthol, phenyl naphthyl ether, methoxyanthracene, methoxyphenanthrene, hydroxynaphthalene, hydroxy 1 to 4 carbon alkyl naphthalene, hydroxyanthracene, or hydroxyphenanthrene with hydrogen peroxide in a high boiling organic solvent having not over 1 weight % of water, which organic solvent does not form an azeotrope with water that boils near or above the boiling point of hydrogen peroxide at normal pressure, said solvent having the following formula:



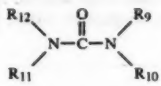
wherein X, Y, and Z are 0, a N-(C_1–C_8)-alkyl group or a N-(VC_4–C_7)-cycloalkyl group, n, m, and p are each 0 or 1, R_1, R_2, and R_3 are C_1–C_8 alkyl or C_4–C_6-cycloalkyl or such an alkyl or cycloalkyl group substituted by halogen, hydroxyl, C_1–C_4-alkoxy, -CN, or phenyl,



wherein R_4 is an alkyl group having 1 to 4 carbon atoms and R_5 and R_6 are H, Cl, F, Br, alkyl having 1 to 4 carbon atoms, methoxy, ethoxy, or $COOR_7$ where R_7 is alkyl having 1 to 4 carbon atoms,



wherein R_8 is alkyl of 1 to 4 carbon atoms or such a group substituted by halogen, hydroxy, or a C_1 to C_3 alkyl group and o is a number from 2 to 5, or



and using a catalyst of the formula XO_2 wherein X is sulfur, selenium or tellurium.

4,551,563

METHOD FOR MAKING POLYMETHYLATED PHENOLS

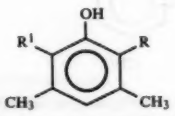
John J. Talley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1984, Ser. No. 613,546

Int. Cl.[4] C07C *37/16, 39/07*

U.S. Cl. 568—804 **4 Claims**

1. A method for making polymethylated phenols of the formula



(I)

from a mixture of isophorone and methanol, comprising effect-

ing contact between an isophorone and methanol mixture having from 0.5 to 5 moles of methanol per mole of isophorone, and the calcination residue of a mixture of magnesium carbonate and/or magnesium hydroxide and manganese hydroxide at a temperature in the range of from 400° to 600° C., where the mixture of isophorone and methanol is passed over the calcination residue at a rate sufficient to maintain a liquid hourly space velocity (LHSV) having a value of from about 0.1 to 3 where

$$LHSV = \frac{\text{volume of feed passed over calcination residue per hour}}{\text{volume of a dry mixture of magnesium carbonate and/or magnesium hydroxide and manganese hydroxide prior to calcination where R and } R^1 \text{ are members selected from hydrogen and methyl}}$$

4,551,564

PROCESS FOR THE PRODUCTION OF 2- AND 4-TERT-BUTYLCYCLOHEXANOLS WITH HIGH PROPORTIONS OF CIS-ISOMERS BY CATALYTIC-HYDROGENATION OF THE CORRESPONDING TERT-BUTYLPHENOLS

Werner Otte, Dorsten; Rudolf Nehring, and Manfred zür Hausen, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,734

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338437; Jan. 17, 1984, 3401343

Int. Cl.⁴ C07C *35/08*

U.S. Cl. 568—834 **18 Claims**

1. A process for the production of 2- or 4-tertbutylcyclohexanol having a high proportion of cis-isomers comprising hydrogenating the corresponding tert-butylphenol in two stages under hydrogen pressures of above 200 bar in each stage, and, in the first stage, on a Pd metal catalyst at a temperature of 120°–280° C. and, in the second stage, on a Ru metal catalyst at a temperature of 70°–200° C.

4,551,565

PROCESS FOR THE PRODUCTION OF ETHYLENE GLYCOL AND/OR GLYCOLLIC ACID ESTERS, AND CATALYST THEREFOR

Haruhiko Miyazaki; Koichi Hirai; Taizo Uda; Yasuo Nakamura, all of Ube; Harumi Ikezawa, Onoda, and Takanori Tsuchie, Ube, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 341,237, Jan. 21, 1982, abandoned. This application Jul. 5, 1983, Ser. No. 510,387

Claims priority, application Japan, Jan. 26, 1981, 56-9059

Int. Cl.⁴ C07C *29/136*

U.S. Cl. 568—864 **11 Claims**

1. In a process for producing ethylene glycol by the vapor phase catalytic hydrogenation of a di(C_1–C_8)alkyl ester of oxalic acid in the presence of a catalyst and hydrogen gas, the improvement wherein

(i) said hydrogenation is carried out at a temperature of about 150° to about 240° C. and a pressure of about 0.5 to about 50 atmospheres for a contact time of about 0.2 to about 6 seconds in a hydrogen/oxalate mole ratio of about 10 to about 500, and

(ii) said catalyst has the following composition formula

$$CuMo_kBa_pO_q$$

wherein k, p and q represent gram-atom of Mo, Ba and O, respectively, per gram-atom of Cu, each of k and p is a positive number of at least 0.01 such that the sum k+p is up to 1.5, and the k/p ratio is in the range of from 0.8 to 1.2, and q is a number determined depending upon the atomic valences and gram-atoms of Cu, Mo and Ba.

4,551,566

PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS

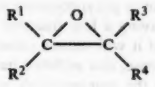
John H. Robson, Charleston, and George E. Keller, II, S. Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 428,815, Sep. 30, 1982, abandoned. This application Sep. 8, 1983, Ser. No. 530,235

Int. Cl.⁴ C07C *29/10, 33/26, 35/14, 31/20*

U.S. Cl. 568—867 **29 Claims**

1. A process for the production of monoalkylene glycol comprising reacting in a liquid phase, a vicinal alkylene oxide of the formula:



wherein R^1, R^2, R^3 and R^4 each designate a hydrogen atom, an alkyl group having between 1 and about 10 carbon atoms, an aryl group having at least 6 carbon atoms, an alkenyl group having 2 or 3 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms, with water in the presence of a sufficient amount of water-soluble vanadate salt to enhance the selectivity of the reaction to monoalkylene glycol, said liquid phase having a pH of between about 8 to 11.

4,551,567

DEETHERIFICATION PROCESS

Lawrence A. Smith, Jr., Bellaire, Tex., assignor to Chemical Research & Licensing Company, South Houston, Tex.

Continuation-in-part of Ser. No. 517,220, Jul. 25, 1983,. This application Sep. 7, 1984, Ser. No. 648,071

Int. Cl.⁴ C07C *29/00, 31/04*

U.S. Cl. 568—907 **18 Claims**

1. A process for the deetherification of ethers comprising of contacting said ether in vapor phase with a solid catalyst composition comprising a resin of a macroporous matrix of polyvinyl aromatic compound crosslinked with a divinyl compound and having thereon from about 3 to 5 milli equivalents of sulfonic acid groups per gram of dry resin, wherein at least 50% to less than 100% of said sulfonic acid groups are neutralized with a metal of Al, Fe, Zn, Cu, Ni or mixtures thereof and said sulfonic acid groups not neutralized with said metal ion are neutralized with alkali metal ions or alkaline earth metal ions of Group 1*a* or 2*a* of the Periodic Table of elements or mixtures thereof.

4,551,568

PROCESS FOR NITRATION OF BENZENE

Hiroshi Sato, Ibaraki, and Shuzo Nakamura, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 15, 1983, Ser. No. 485,453

Claims priority, application Japan, Apr. 16, 1982, 57-64202

Int. Cl.⁴ C07C *79/10*

U.S. Cl. 568—939 **10 Claims**

1. A gas-phase nitration process of benzene with a nitrating agent of NO_2 or N_2O_4, which consists essentially of carrying out the process in the presence of a catalyst composed of an acidic mixed oxide consisting of at least one component selected from the group of WO_3, MoO_3 and TiO_2 as indispensable component and containing optionally SiO_2 and/or ZnO, the sole components of the mixed oxide being selected from the group consisting of WO_3, MoO_3, TiO_2, SiO_2, and ZnO.

4,551,569

TELECOMMUNICATION CABLE FILLING COMPOSITION

Stefan Verne, London, England, assignor to BICC Public Limited Company, London, England

Continuation of Ser. No. 400,480, Jul. 21, 1982, abandoned, which is a continuation of Ser. No. 177,925, Aug. 13, 1980, Pat. No. 4,356,342, which is a continuation-in-part of Ser. No. 87,437, Oct. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 952,590, Oct. 18, 1978, abandoned. This application Aug. 28, 1984, Ser. No. 645,163

Int. Cl.⁴ H01B *3/22, 11/02*

U.S. Cl. 585—6.6 **5 Claims**

1. A cable-filling medium having a base comprising a hydrocarbon oil characterised by the use of two non-polar additives, namely:

(i) a first additive which is soluble and consists substantially of molecules that are substantially incapable of diffusing into polyethylene or polypropylene at temperatures of up to 80° C. but having a low (number average) molecular weight such that it will reduce substantially the osmotic pressure of the base, this additive having no appreciable useful effect on the composition's resistance to flow at temperatures in the range 50°–80° C.; and

(ii) a second additive which is polymeric and which is also soluble and has a high enough (viscosity average) molecular weight to raise the resistance to flow of the composition so that a cable filled with the composition will pass a water-penetration test as defined in Post Office Telecommunications Specification No. CW236 (issued by the Post Office Corporation in Great Britain) not only at room temperature but also at temperatures up to a limit that is higher than 50° C.

4,551,570

PROCESS FOR THE ISOMERIZATION OF LIMONENE TO TERPINOLENE

Walter E. Johnson, Jr., Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,412

Int. Cl.⁴ C07C *5/30*

U.S. Cl. 585—355 **8 Claims**

1. A process for isomerizing limonene to terpinolene at a temperature of from 75 degrees C. to 200 degrees C. in the presence of a catalytic amount of orthotitanic acid catalyst which is characterized by the inclusion in the isomerization mass of less than 2% by weight of the catalyst of a buffer selected from alkali metal or alkaline earth metal or ammonium acetates, carbonates, bicarbonates, citrates, hydroxides, oxides, phosphates, acid phosphates, and stearates.

4,551,571

PRODUCTION OF ALKENYLBENZENES

Kohei Sarumaru; Tomoatsu Iwakura, both of Aml; Yasuo Yoshino; Toshimichi Ito, both of Hasaki; Akikazu Watanabe, and Mikio Mori, both of Mie, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

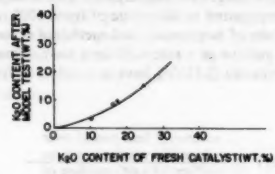
Filed Mar. 6, 1985, Ser. No. 708,743

Claims priority, application Japan, Mar. 14, 1984, 59-48453; Mar. 14, 1984, 59-48454

Int. Cl.⁴ C07C *4/02, 2/64*

U.S. Cl. 585—440 **6 Claims**

1. In a method for producing an alkenylbenzene by catalytically dehydrogenating an alkylbenzene under a non-oxidative condition in the presence of steam in the reaction zone comprising a fixed-bed of potassium-based dehydrogenation catalyst particles, the improvement in which (a) said fixed-bed comprises particles of at least two kinds of potassium-based dehydrogenation catalyst with respectively different potassium contents and (b) the catalyst particles with higher potassium content are not disposed on the upstream side of said fixed-bed with respect to said reaction.



4,551,572

PROCESS FOR REACTING AROMATIC COMPOUNDS

Jeffrey T. Miller, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 17, 1984, Ser. No. 641,830

Int. Cl.⁴ C07C *2/86*

U.S. Cl. 585—454 **18 Claims**

1. A method for reacting an aromatic compound, water and carbon monoxide, at a temperature in the range of from about 300° C. to about 480° C., at a pressure in the range of from about 5 to about 150 kilograms per square centimeter, and in the presence of a catalyst composition comprising a cadmium component and a support material having acidic properties, wherein the cadmium component is in the form of the elemental metal, its oxide or salt or a combination thereof, and wherein the cadmium component is present at a concentration level in the range of from about 0.1 to about 20 weight percent, calculated as cadmium oxide and based on the weight of the catalyst, with the mole ratio of carbon monoxide-to-water being in the range of from about 4:1 to about 1:4 and with the mole ratio of carbon monoxide-to-aromatic compound being in the range of from about 2:1 to about 1:10.

4,551,573

ALKYLATION OF AROMATIC COMPOUNDS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1984, Ser. No. 655,825

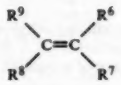
Int. Cl.⁴ C07C *2/64, 2/68*

U.S. Cl. 585—459 **25 Claims**

1. A process comprising contacting

(a) at least one monocyclic, bicyclic or tricyclic aromatic compound having 6 up to 30 carbon atoms and

(b) at least one olefinic compound having the formula



wherein each of R^6 through R^9 is independently selected from hydrogen and C_1 through C_{10} alkyl or cycloalkyl radical; or R^6 and R^7 or R^6 and R^9 can be joined as part of a polymethylene or alkyl- or cycloalkyl-substituted polymethylene radical having two to about 20 carbon atoms, wherein said olefinic compound has 4 up to 30 carbon atoms, and wherein said olefinic compound is capable of forming a tertiary carbocation under the process conditions in the presence of a catalyst consisting essentially of

(i) AlX_3 and

(ii) I_2;

wherein each X is individually selected from the halogens.

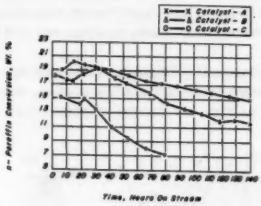
4,551,574

INDIUM-CONTAINING DEHYDROGENATION CATALYST

Tamotsu Imai, Mount Prospect, Ill., and Chi-wen Hung, San Rafael, Calif., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 13, 1984, Ser. No. 640,288
Int. Cl.[4] C07C *5/333*
U.S. Cl. 585—660 **3 Claims**

1. A process for dehydrogenating dehydrogenatable hydrocarbons having from 2 to 20 or more carbon atoms which comprises contacting said hydrocarbons at dehydrogenation conditions in a dehydrogenation zone with a catalyst comprising a platinum group component, a tin component, an indium component, an alkali or alkaline earth component, and a porous support material wherein the atomic ratio of indium to platinum group component is about 1.6, or higher.



4,551,575

SUBSTRATE FOR AMORPHOUS SILICON SEMICONDUCTOR MATERIAL

Kiyoshi Takahashi; Makoto Konagai, both of Tokyo; Toshihiko Yoshitomi, Sagamihara, and Takeshi Omori, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,721
Claims priority, application Japan, Sep. 24, 1982, 57-166161
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—255 6 Claims

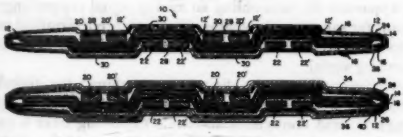
1. An amorphous silicon semiconductor solar cell comprising one or more layers of amorphous silicon semiconductor material, a metal substrate on one side of and in contact with the amorphous silicon semiconductor material and a transparent electroconductive layer or Schottky barrier layer on the other side of and in contact with the silicon semiconductor material, characterized in that the surface of the metal substrate in contact with the amorphous silicon semiconductor is the surface of a two layer laminated metal or alloy film present upon an aluminum plate or film base and formed by means of an electroplating treatment on said aluminum plate or film base.

4,551,576

FLAT EMBEDDED-SHIELD MULTICONDUCTOR SIGNAL TRANSMISSION CABLE, METHOD OF MANUFACTURE AND METHOD OF STRIPPING

Donald S. Rich, Long Valley, N.J., assignor to Parlex Corporation, Methuen, Mass.

Filed Apr. 4, 1984, Ser. No. 596,534
Int. Cl.[4] H01B *7/08, 11/00*
U.S. Cl. 174—36 17 Claims



1. A flat embedded shield multiconductor signal transmission cable having elements including at least two adjacent conductors laterally spaced apart and occupying different planes, said cable including a sheet-like shield of electrically conductive material running between said adjacent conductors across at least a portion of the width of said cable, said conductors positioned to either side of said shield in different planes and in a laterally offset fashion, said cable having an outer skin and means for insulating said conductors one from the other and from said shield, whereby cross-talk between said adjacent conductors is substantially reduced.

4,551,577

RETRACTABLE POWER CENTER

Norman R. Byrne, 2736 Honey Creek, NE., Ada, Mich. 49301

Filed Jul. 25, 1983, Ser. No. 517,182
Int. Cl.[4] H01H *9/02*
U.S. Cl. 174—57 20 Claims

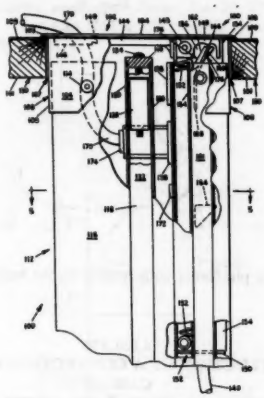
1. In a power center mounted in a desk or work surface at a selectible working height, and comprising receptacle means supplying electrical power from an interconnected common power source to selectively interconnected electrical devices, the improvement which comprises:

a stationary housing means mounted within a slot formed in the desk or work surface;

carriage means coupled to the housing means and mounting the receptacle means so as to be movable with respect to the housing means;

spring activating means coupling the housing means and the carriage means and imparting forces to the carriage means so as to move the carriage means and receptacle means between a retracted, closed position and an extended, open position, wherein the receptacle means is substantially hidden from view when the carriage means is in the retracted position, and the receptacle means is accessible to a user to receive power cords and plugs of the electrical devices when the carriage means is in the extended position;

securing means releasably maintaining the carriage means in the retracted position and responsive to manually exerted forces to automatically release the carriage means and



allow the activating means to impart the forces to the carriage means;

the receptacle means are mounted to the carriage means so that the electrical devices can remain energized from the power source when the carriage means is in the retracted, closed position; and

the carriage means comprises means allowing the power cords of the electrical devices to extend below the surface and remain connected to the receptacle means when the carriage means is in the retracted, closed position and substantially hidden from view.

4,551,578

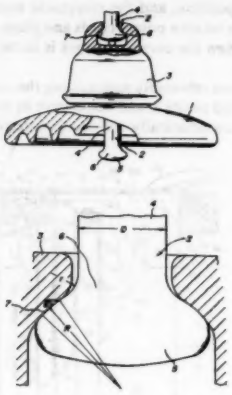
BALL AND SOCKET TYPE SUSPENSION INSULATOR

Hiroshi Nozaki, Nagoya, Japan, assignor to NKG Insulators, Ltd., Japan

Filed Mar. 18, 1985, Ser. No. 712,605
Claims priority, application Japan, Mar. 28, 1984, 59-60028
Int. Cl.[4] H01B *17/08, 17/38*
U.S. Cl. 174—182 1 Claim

1. A ball and socket type suspension insulator, wherein the radius of curvature at the fillet portion between a pin shank portion and a ball portion of a ball pin buried and secured into the inside of a head portion of an insulator body is designed at 30–40% of the diameter of the pin shank portion, and the angle

which a contact surface between the socket portion of the cap attached to the outer surface of the head of the insulator body



and the ball pin forms with respect to the horizontal plane is 38°–45°.

4,551,579

CONSTRUCTION OF A CONNECTION FOR FLAT CABLES

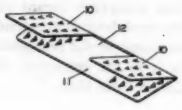
Shuichi Takasaki, Moriguchi, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

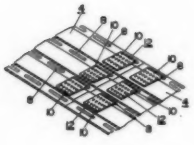
Filed Sep. 28, 1983, Ser. No. 536,729

Claims priority, application Japan, Oct. 8, 1982, 57-153433[U]

Int. Cl.⁴ H01R *9/07, 4/18*

U.S. Cl. 174—88 R **3 Claims**





1. A connection of two electrically conductive flat cables and a connector therefor, each cable having an outer sheath of insulating material with at least one elongated flat electrical conductor embedded in said insulating material and a web portion, containing no conductor, extending along at least one elongate edge of the cable, said connection comprising:

a series of elongated apertures through said web portion at spaced intervals along the length thereof;

said connector being of an electrically conductive flat material bent into a generally "U" shape having two upper segments and a lower segment connected to said upper segments by bending portions;

a plurality of upstanding sharpened pawls projecting from the inner surface of at least one of said upper or lower segments;

the two upper segments being spaced apart a distance equal to the distance between two of said elongated apertures, the two upper segments passing through two of said elongated apertures and the upper and lower segments mechanically bent toward each other along the bending portions sandwiching therebetween end portions of the two adjacent flat cables with the sharpened pawls piercing said insulating material and contacting the embedded electrical conductors of both said cables and establishing an electrical connection between the conductors.

4,551,580

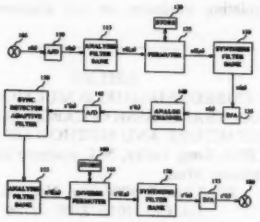
TIME-FREQUENCY SCRAMBLER

Richard V. Cox, Piscataway, and Nuggehally S. Jayant, Short Hills, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 22, 1982, Ser. No. 443,483

Int. Cl.⁴ H04K *1/04*

U.S. Cl. 179—1.5 S **20 Claims**



1. Apparatus for scrambling an analog signal comprising:

means for sampling the analog signal at a predetermined rate to develop digital sample signals corresponding to the analog signal;

means responsive to the digital sample signals for digitally forming a plurality of contiguous subband digital sample signals, said contiguous subbands extending over a prescribed portion of the frequency spectrum of the analog signal spectrum;

means for partitioning the digital sample signals of each subband into digital signal blocks;

means for permuting the digital signal blocks of a predetermined group of blocks;

means for digitally combining the permuted subband digital signal blocks into a single band digitally samples signal; and

means responsive to said combined permuted single band digitally signal block sample signals for forming a scrambled analog signal.

4,551,581

METHOD AND APPARATUS FOR SENDING A DATA MESSAGE TO A SELECTED STATION DURING A SILENT INTERVAL BETWEEN RINGING

Carolyn A. Doughty, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 12, 1983, Ser. No. 512,955

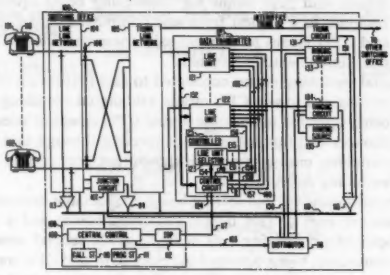
Int. Cl.⁴ H04M *11/00*

U.S. Cl. 179—2 A **23 Claims**

1. For use with a telephone switching system serving a plurality of stations and having a central processor for generating a data message and a ringing circuit for transmitting a first and a second ringing signal to a selected one of said stations, said first and second ringing signals having a silent interval therebetween, apparatus for sending a data message to a selected station during the silent interval between ringing signals while the apparatus remains connected to the ringing circuit; comprising:

detector means connectable to said ringing circuit and re-

sponsive to said first ringing signal for generating a status signal representative of said silent interval between said first and second ringing signals; and



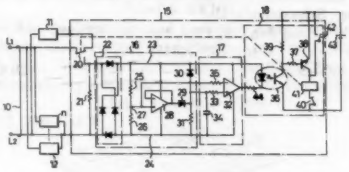
sender means responsive to said status signal for sending to said selected station a signal representative of said data message during said silent interval.

4,551,582

CIRCUIT FOR AUTOMATICALLY RELEASING HOLDING STATE OF TELEPHONE SYSTEM

Nobuo Matsuo, Kawasaki, Japan, assignor to Nitsuko Limited, Kanagawa, Japan

Filed Mar. 30, 1984, Ser. No. 595,387
Claims priority, application Japan, Nov. 28, 1983, 58-221966
Int. Cl.[4] H04M *1/00*
U.S. Cl. 179—81 R **8 Claims**



1. An automatic hold releasing circuit for use in a branch telephone system including a plurality of telephone sets connected in parallel across a pair of wires of a subscriber's line, comprising:

switching means for selectively connecting said subscriber line wires with either a line seizing resistor in order to place the subscriber's line on hold or with one of said plurality of telephone sets;

voltage detecting means for continually providing an output indicating the voltage across the subscriber's line wires;

voltage comparing means for continually comparing the voltage across the subscriber's line wires after said line was placed on hold with the voltage across the subscriber's line wires at the time the live was initially placed on hold by said switching means, thus to detect a drop in voltage across said wires in order to provide an output indicating that any of said telephones connected in parallel other than said one telephone has been taken off-hook; and

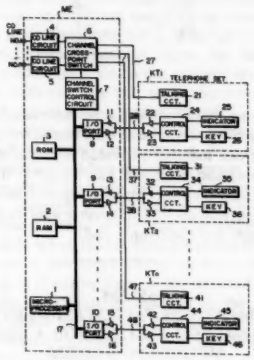
said switching means including a switching element and switch driving means, said switch driving means selectively actuating said switching element to thereby connect said line seizing resistor between said subscriber line wires, and deactuating said switching element to disconnect said line seizing resistor in response to the output from said voltage comparing means, thereby to release said subscriber's line from hold.

4,551,583

CONTROL SIGNAL TRANSMISSION SYSTEM FOR KEY TELEPHONE SYSTEM

Koichi Sekiguchi, Asaka; Hikaru Takematsu, Higashikurume; Kazuyuki Yamamoto, and Teruyuki Kubo, both of Yokohama, all of Japan, assignors to Telegraph & Telephone Pub. Corp. and Iwasaki Tsushinki Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 346,006, Feb. 5, 1981, which is a continuation-in-part of Ser. No. 172,012, Jul. 24, 1980, abandoned. This application Mar. 8, 1984, Ser. No. 587,373
Claims priority, application Japan, Jul. 30, 1979, 54-97066
Int. Cl.[4] H04M *1/00*; H04Q *5/18*
U.S. Cl. 179—99 M **5 Claims**



1. In a key telephone system comprising a key service unit, a plurality of key telephone sets connected to the key service unit each key telephone set having keys operable for developing key information signals and indicators for indicating the busy status of a plurality of CO lines corresponding to said keys, a plurality of pairs of parallel communication lines each connecting a corresponding key telephone sets individually to the key service unit;

the improvement comprising: a plurality of pairs of parallel control lines, each pair connecting a corresponding key telephone set individually to the key service unit; each key telephone set having a parallel-serial converter for converting key information signals to a serial signal configuration for transmission through a corresponding one of said pairs of parallel control lines to said key service unit;

a random-access memory in said key service unit for receiving and storing the key information signals of the key telephone sets;

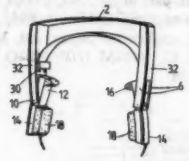
said key service unit having means effective for connecting and disconnecting said pairs of parallel communication lines to selected ones of said CO lines in reponse to said key information signals and to store status signals representative of said busy status of each CO line and transmit said status signals to each key telephone set over said corresponding parallel control lines.

control means in the key service unit for controlling said storage of the status signals for accessing all of the pairs of parallel control lines simultaneously for key information signals and applying them in a first synchronized access time into the key service unit random-access memory, said control means including additonal control means for reading out from said random access memory stored status signals and applying them at a second synchronized access time through corresponding parallel control lines to the parallel-serial converters of the corresponding key telephone sets as control signals for activating the corresponding indicators of said key telephone sets.

4,551,584
EARPHONE SET

Herluf S. Mathiasen, Virum, Denmark, assignor to Bang & Olufsen A/S, Struer, Denmark

Filed Apr. 13, 1984, Ser. No. 600,160
Claims priority, application Denmark, Apr. 15, 1983, 1652/83
Int. Cl.[4] H04M *1/05*
U.S. Cl. 179—156 R 4 Claims

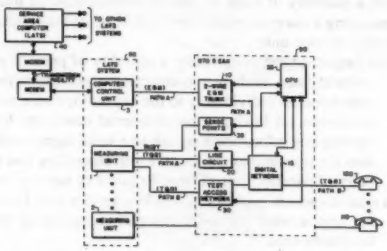


1. An earphone set comprising a resilient head band having an earphone carrier portion on at least one of its opposed ends, an elongate carrier member provided with an earphone unit adjacent one end and a temple pad adjacent the other end thereof, and means pivotally connecting said carrier member to said carrier portion about a transverse axis located between the earphone unit and the temple pad.

4,551,585
ARRANGEMENT FOR FACILITATING EXTERNAL LOOP ANALYSIS TESTING FOR A DIGITAL SWITCHING SYSTEM

William R. Daniels, Chicago, Ill., and John S. Young, Scottsdale, Ariz., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 28, 1983, Ser. No. 566,246
Int. Cl.[4] H04B *3/46*
U.S. Cl. 179—175.3 R 15 Claims



1. In an arrangement for facilitating external loop analysis testing for a digital switching system, a loop analysis and test system (LATS) having a computer control unit and at least one measuring unit each being connectable to said digital switching system for transmitting testing information between each said unit, said arrangement for facilitating external loop analysis testing comprising:

CPU means;

a plurality of sense point means connected to said CPU means;

a plurality of connections, a connection from each of said plurality of sense point means to a corresponding measuring unit;

each said sense point means being operated to contain a first logic value for a busy condition of said corresponding measuring unit or alternatively each said sense point means being operated to contain a second logic value for an idle condition of said corresponding measuring unit; and

said CPU being operated to interrogate each said sense point means for determining said busy and said idle condition of each said corresponding measuring unit;

first means for connecting being connectable to said computer control unit of said LATS and being connected to said CPU means, said first means for connecting being operated in response to a request from said computer control unit and said CPU means to connect said computer control unit to said digital switching system;

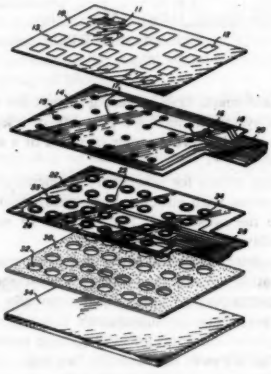
digital switching means connected to said first means for connecting and to said CPU means, said digital switching means being operated in response to said CPU means to selectively connect said first means for connecting through said digital switching means to a particular output port of said digital switching means;

second means for connecting being connectable between said output port of said digital switching means and a corresponding measuring unit of said LATS, second means for connecting being operated in response to said CPU means to connect said corresponding measuring unit to said output port for transmitting said testing information between said computer control unit and said measuring unit.

4,551,586
MULTIPLE CONTACT LAYER MEMBRANE SWITCH

Leonard Latasiewicz, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 18, 1984, Ser. No. 621,987
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—5 A 20 Claims



1. A membrane switch assembly comprising a flexible first layer, a second layer having a plurality of contacts, a third layer having a plurality of contacts, certain of said third layer contacts being in registration with at least a portion of said second layer contacts, and a fourth layer having at least one contact area, certain of said third layer contacts being of a configuration so as to permit contact between each such third layer contact, a second layer contact in registration therewith and the fourth layer contact area when an area of said flexible first layer in registration with said second and third layer contacts is compressed.

4,551,587

ROTARY SWITCH FOR PRINTED CIRCUIT BOARDS

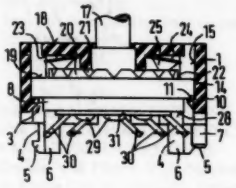
Jochen Rose, Röthenbach, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,039

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225694

Int. Cl.⁴ H01H *19/58*

U.S. Cl. 200—11 R **11 Claims**



1. A rotary switch for being mounted on a printed circuit board, said switch comprising:

a housing defining a throughgoing aperture;

a rotor with a centric shaft, said centric shaft defining a throughgoing aperture, said rotor is frictionally mounted in said housing; and

a rotating control shaft being axially adjustably mounted in the centric shaft aperture, and said centric shaft aperture being sized to adjustably receive said control shaft,

and said control shaft projecting through said housing aperture.

4,551,588

TIMER DEVICE

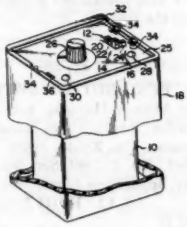
Hiromi Kubota, Shizuoka, and Toshiyuki Kambe, Mishima, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,388

Claims priority, application Japan, Jun. 27, 1983, 58-98934[U]

Int. Cl.⁴ H01H *43/00*

U.S. Cl. 200—33 R **2 Claims**



1. A timer device comprising:

timer circuit means;

time unit setting switch means which is movable to a selected one of plural positions to set a corresponding one of plural kinds of time units in the timer circuit means;

a housing for containing the timer circuit means and the time unit setting switch means;

a time setting knob connected to the timer circuit means to operate the timer circuit means and arranged to project from the housing;

at least two scale plates each having a through-hole through which the time setting knob is received, each scale plate having a time scale corresponding to a different one of the plural kinds of time units;

time scale attaching means for detachably mounting the scale plates individually onto the housing at a predetermined position; and

scale-plate-guiding and time-unit-setting switch-position-holding means arranged at that area of each of said scale plates which area corresponds to the position of the time unit setting switch means when the scale plate confronts the housing at said predetermined position, wherein said guiding and holding means enables the scale plate attaching means to attach a selected scale plate to the housing at the predetermined position and prevents the time unit setting switch means from moving from an initial position which sets a particular time unit in the timer circuit means, when the time unit represented by the time scale on the selected scale plate coincides with the time unit set in the timer circuit means by the time unit setting switch means, and wherein said guiding and holding means prevents the selected scale plate from being attached to the housing at the predetermined position when the time unit represented by the time scale on the selected scale plate fails to coincide with the time unit set in the timer circuit means by the time unit setting switch means;

wherein the time unit setting switch means is of the slide type, and the scale-plate-guiding and time-unit-setting switch-position-holding means comprises a part of each of the scale plates, said part having a hole extending at least partially through a thickness of said scale plates into which hole a button of the time unit setting switch means is insertable when said button is located at a certain position to set in the timer circuit means a time unit corresponding to the time scale on the selected scale plate and when the scale plate is attached to the housing at the predetermined position and wherein the time unit setting switch means is prevented by said part from moving from said initial position.

4,551,589

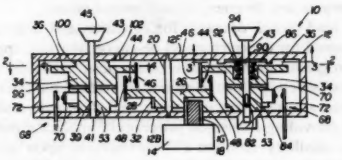
VARIABLE POWER CONTROL DEVICE

Teamus Bowling, 4310 Starlite La., Louisville, Ky. 40291

Filed Mar. 9, 1984, Ser. No. 587,829

Int. Cl.⁴ H01H *7/00*

U.S. Cl. 200—38 A **19 Claims**



1. A variable, adjustable control device for variably controlling the duty cycle for an electrical load comprising:

electrical cycling contact switch means having two movable contact arms adapted for movement toward and away from each other; a rotatable cycling cam means operatively associated with one of the contact arms of the cycling contact switch means for opening and closing the gap between the movable contact arms of the cycling contact switch means as a function of the development of the cam surface of the cycling cam means;

motor means for rotating the cycling cam means at a constant angular velocity;

on-off contact switch means operatively associated with means;

on-off rotatable cam means operatively associated with the on-off contact switch means for opening and closing the on-off switch means; and,

rotatable adjustment cam means operatively associated with the outer one of the movable contact arms of the cycling contact switch means for adjusting the gap between the contacts of the movable contact arms of the cycling switch

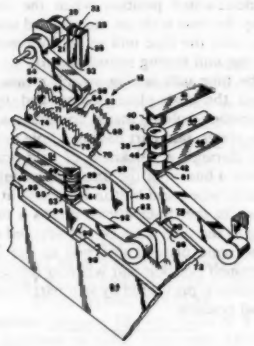
means as a function of the development of the the cam surface of the adjustable cam means.

4,551,590

APPLIANCE CONTROL AND PROGRAMMER TIMER THEREFOR

Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 14, 1984, Ser. No. 610,225
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R **15 Claims**



15. An electromechanial programmer timer for an electrically energized appliance comprising,

(a) timing motor means operable to provide rotation, of a shaft means at a predetermined rate;

(b) a motor switch operable upon actuation and deactuation to energize and de-energize said motor means;

(c) a load switch operable for actuation and deactuation and adapted for energizing and de-energizing said appliance;

(d) program cam means selectively positionable by the operator of said appliance to an initial position and operable upon timed advancement to actuate and deactuate said switches for providing a selected program of appliance operation;

(e) an auxiliary function switch operable upon actuation to shunt said load switch;

(f) advance means connected to said shaft means and operable upon rotation of said shaft means to step-index said program cam means for the selected program interval from said initial position to a timed-out position, said advance means operable in a first mode of initial positions of said program cam means corresponding to a minimum program interval to advance said program cam means at a first expanded rate for time-out, said advance means in response to a second mode of initial positions of said program cam means is operable to advance said program cam means at a second compressed rate less than said first rate, said advance means upon time-out of said selected program interval, operable to advance said program cam means at a third rate for time-out of an auxiliary function interval; and,

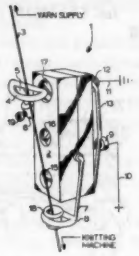
(g) sub-interval cam means connected for rotation by said shaft means and operable to actuate and deactuate said auxiliary function switch for intervals comprising a fraction of the period of rotation of said shaft means, wherein said cam means is operable upon program time-out and advancement at said third rate and time-out of said auxiliary interval to effect deactuation of all of said switch means.

4,551,591

STOP MOTION SWITCH

Robert E. Jones, Rte. 4, Box 509, Hickory, N.C. 28601

Filed Jun. 18, 1984, Ser. No. 621,841
Int. Cl.[4] B65H *25/14*; D04B *35/12*; F26B *13/12*
U.S. Cl. 200—61.13 **5 Claims**



1. A switch adapted to be in engagement with an elongated filament and responsive to a break in said elongated filament to cause the switch to go from a "first" to a "second" position comprising:

(a) a rocker arm including first, median and second members made from material adapted to conduct electricity, one end portion of either of the first and second members containing a filament guide means; and,

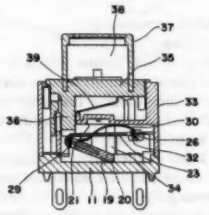
(b) a dielectric block containing (i) an aperture therein into which the median member portion of the rocker arm is rotatably received, (ii) a first terminal means in continuous electrical communication with the median member of the rocker arm, (iii) a second terminal means adapted to be in electrical communication with ground and, (iv) an elongated member adapted to conduct electricity connected to said second terminal means, a portion thereof spaced apart from the dielectric block in such a fashion that upon rotation of the rocker arm the second member comes in sliding electrical and mechanical contact with the elongated member by making an initial mechanical and electrical contact therewith at a first position and sliding along the longitudinal axis thereof to a second position different from that of the first.

4,551,592

PUSH-BUTTON SWITCH

Hiroyuki Nishi; Mitsuji Hayashi, both of Nagaokakyo, and Motoyuki Tomizu, Kyoto, all of Japan, assignors to Omron Tateisi Electronics, Co., Kyoto, Japan

Filed Mar. 2, 1984, Ser. No. 585,465
Claims priority, application Japan, Mar. 5, 1983, 58-31715[U]
Int. Cl.[4] H01H *5/30*
U.S. Cl. 200—67 D **2 Claims**



1. A push-button switch, comprising:

a base member provided on one surface with a bearing portion, fixed contacts and a pair of studs;

a link member comprising a first end having a support shaft pivotally received in said bearing portion of said base member, and a second end having a hinge portion;

a movable, T-shaped electrically conductive plate piece having a broad end which has movable contacts for connection to said fixed contacts, and a narrow end pivotally engaged with the hinge portion of said link member;

a reversing spring in the form of a generally U-shaped plate spring in a bent configuration, engaged with said studs at its free ends and engaged with said movable piece at its base; and

a push-button movably disposed for vertical movement with respect to said base, to depress the link member in the vicinity of said hinge portion.

4,551,593

MECHANISM FOR THE SUDDEN TRIPPING OF AN ELECTRICAL CONTACT UNDER THE EFFECT OF A SLOW VARIATION IN PRESSURE

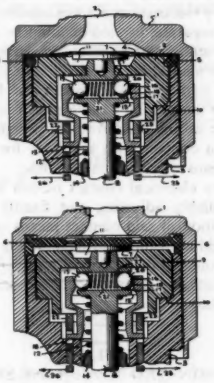
Maurice De Raco, Grasse, and Pierre Rey, Menton, both of France, assignors to Eaton S.A.M., Monaco, France

Filed Dec. 27, 1983, Ser. No. 566,072

Claims priority, application Monaco, Nov. 21, 1983, 1665

Int. Cl.[4] H01H *35/24*

U.S. Cl. 200—81 R **12 Claims**



1. A mechanism for the instantaneous tripping of an electrical contact in response to a progressive variation in applied fluid pressure, comprising:

a housing, the interior of said housing being fluid connected to a source of pressurized fluid,

a conductive element located in said housing, said conductive element having a longitudinal axis and movable along said axis between an open position and a closed position and having an interior wall and an exterior wall, said interior wall at the upper portion thereof comprising opposed first and second connecting sloping sections of substantially triangular cross-section having a side in common at their connection, and a throttle defined by the connection between said first and second sloping sections,

cage means at least partially positioned within said conductive element and movable therein in response to the applied fluid pressure in a direction substantially parallel to said longitudinal axis of said conductive element, said cage means including a head portion having channel means therethrough, said channel means having a longitudinal axis substantially perpendicular to said longitudinal axis of said conductive element, and at least one ball housed in said channel means and movable along said longitudinal axis of said channel means and up and down said sloping sections in response to the movement of said cage means within said conductive element,

first means for exerting on said at least one ball a transverse elastic force substantially parallel to said longitudinal axis of said channel means and directed towards said sloping sections, said force breaking down into a first vertical component acting on said first sloping section in a first direction substantially parallel to said longitudinal axis of said conductive element and a second vertical component acting on said second sloping section in a second direction opposite said first direction, and

second means engaging said cage means for exerting an said cage means an elastic force in opposition to the pressure variations to be controlled,

the passage of said at least one ball through said throttle causing the instantaneous displacement of said conductive element from one to the other of said open and closed positions.

4,551,594

OIL PRESSURE SWITCH

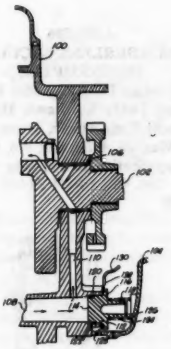
Tadashi Katoh, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,791

Claims priority, application Japan, Jun. 20, 1983, 58-110675

Int. Cl.[4] H01H *35/40*

U.S. Cl. 200—82 R **7 Claims**



1. An oil pressure switch for an engine lubricating system, comprising

a port through a wall of the lubricating system;

a piston slidably mounted in said port;

a spring bias means for biasing said piston into said port;

an elastic, electrical conductor exhibiting a change in conductivity under compression, said elastic, electrical conductor being between said piston and the lubricating system wall for compression by said spring bias means; and

a monitoring circuit including said conductor in series.

4,551,595

TAPE SWITCH WITH CORRUGATED WAVY CONDUCTOR

Robert H. Koenig, Huntington Hills, N.Y., and Walter Lovell, Wilbraham, Mass., assignors to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,494

Int. Cl.[4] H01H *1/06, 13/04*

U.S. Cl. 200—86 R **2 Claims**

1. Tape switch comprising:

a first insulating cover strip,

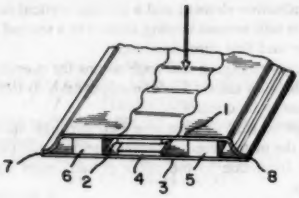
a second insulating cover strip,

a first conductive strip bonded to the first cover strip,

said first cover strip and said first conductive strip having a corrugated wavy form,

first and second spacer strips running parallel to each other and mounted between the first and second cover strips,

a second conductive strip bonded to the second cover strip between the first and second insulated strips,



whereby when the tape switch is pressed at any point, contact is made between the first and second conductive strips.

4,551,596

SURGE-ABSORBERLESS VACUUM CIRCUIT INTERRUPTER

Ryuji Watanabe, Toukai; Hisashi Ando, Hitachi; Keiichi Kuniya, Hitachi, and Yukio Kurosawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,306
Claims priority, application Japan, Mar. 26, 1982, 57-47423
Int. Cl.⁴ H01H *33/66*
U.S. Cl. 200—144 B **16 Claims**

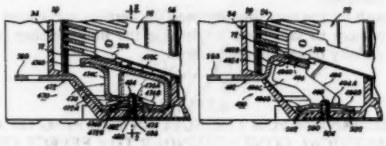
1. A vacuum circuit interrupter comprising a vacuum container confining a vacuum atmosphere of a pressure less than 10^{-5} mmHg and a pair of electrodes at least one of which is a movable electrode for making and breaking an electric load circuit including either a transformer of a rated surge voltage strength of less than 45 kV or a motor of a rated surge voltage strength of less than 25 kV, wherein at least one of said electrodes is provided with a contact of an alloy of low surge voltage characteristics, said alloy consisting essentially of a porous body of a refractory conductive material and an intermetallic compound selected from the group consisting of silver telluride, silver selenide, and mixtures thereof, and being substantially free of free silver, impregnated in said porous body, said interrupter having a chopping current of not more than 1A and a high frequency arc extinguishing capability of not more than 27 A/μs when measured in a circuit of 6 kV, whereby said interrupter can operate in said electric load circuit without a surge absorber for protecting the load in the load circuit from a surge voltage generated at the time of breaking said electric load circuit.

4,551,597

MOLDED CASE CIRCUIT BREAKER WITH ADJUSTABLE STATIONARY LOWER ELECTRICAL CONTACT

Alfred E. Maier, Chippewa, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 19, 1983, Ser. No. 562,644
Int. Cl.⁴ H01H *1/34*
U.S. Cl. 200—249 **9 Claims**



1. An electrical circuit breaker comprising

a base,

a movable electrical contact and

an adjustable stationary electrical contact,

said movable and stationary electrical contacts being movable into a CLOSED position and into an OPEN position,

said stationary electrical contact comprising a formed spacer bracket, a separate, formed conductive contact having an elongated stationary contact arm disposed above and secured to said spacer bracket, contact means fixedly secured to said stationary contact arm for physically and electrically contacting said movable electrical contact, and spacer means comprising a plurality of deflectable members in contact with said base for maintaining said contact means spaced from said base,

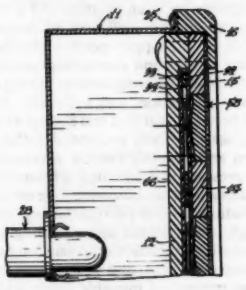
said stationary electrical contact further comprising means for controllably adjusting and fixedly maintaining the spatial position of said contact means within said circuit breaker, said adjusting and maintaining means determining the amount of deflection of said deflectable members which adjusts the distance between said contact means and said base.

4,551,598

ILLUMINATED MEMBRANE SWITCH

Lawrence E. Hamilton, Chicago, and Renzo N. Rutili, Evanston, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 536,637, Sep. 28, 1983, Pat. No. 4,493,958. This application May 16, 1984, Ser. No. 610,652
Int. Cl.⁴ H01H *9/18*
U.S. Cl. 200—314 **11 Claims**



1. An illuminated membrane switch assembly, comprising; a first flexible film member having a partly opaque conductive area on one side thereof, a second flexible film member adja-

cent and normally spaced from the one side of the first film member, said second film member having a partly opaque conductive area aligned with the first conductive area and being on the side of said second film member adjacent said first film member, said second conductive area including spaced switch contacts positioned to be electrically closed when simultaneously contacted by the conductive area on the first film member when one of the film members is pressed into engagement with the other film member, at least one of said conductive areas having opaque portions extending substantially centrally across the conductive area, a movable switch actuator member mounted adjacent one of the first and second film members having indicia thereon adapted to be illuminated, said actuator member having an axis substantially perpendicular to said film members and a translucent light diffusing surface substantially parallel and aligned with the conductive areas on the first and second film members, a transparent backplate behind and supporting the first and second film member, and a source of light positioned behind the first and second film members to direct light through the backplate substantially parallel to and substantially along said axis, through the first and second film members conductive areas and into the actuator member to be diffused therein by the light diffusing surface to eliminate shadowing caused by the conductive area.

4,551,599

COMBINED ELECTROSTATIC OBJECTIVE AND EMISSION LENS

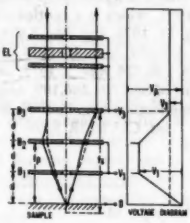
Helmut Liebl, Eching, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Aug. 22, 1983, Ser. No. 525,413

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231036

Int. Cl.⁴ H01J *37/26*

U.S. Cl. 250—396 R **6 Claims**



1. In a combined objective and emission lens system for a particle-optical instrument, such as a microbeam probe for SIMS, with said system comprising a plurality of electrodes coupled in each case to a source of potential so that, in cooperation with a conductive sample surface, said system focuses a bundle of primary rays on a small spot of the sample surface and collimates the secondary particles emitted by this spot into a bundle of secondary rays which leaves the electrode system in a direction substantially opposite to the bundle of primary rays; the improvement wherein said system includes:

(a) a first electrode arrangement disposed adjacent the sample surface and having a first electrode (B_1) which is immediately opposite the sample surface at a first given distance (d_1) and at least a second electrode (B_2) arranged at a given second distance (d_2) from said first electrode (B_1) on the side of said first electrode facing away from the sample surface, a first potential (V_1) applied to said first electrode such that the electric field strength between said first electrode and the sample surface is at least about 40% of the vacuum breakdown field strength, a second potential (V_2) with respect to the sample surface applied to said second electrode, and said first and second distances (d_1, d_2) and said first and second potentials (V_1, V_2) are so proportioned that the bundle of primary rays accelerated by a given accelerating voltage (V_p) is focused on a spot (PF) of the sample surface and the bundle of secondary rays emanating from this spot is focused into an intermediate image (BP) in an image plane located on that side of said first electrode arrangement which faces away from the sample surface, at a close distance from the last electrode of said first electrode arrangement; and

(b) a second electrode arrangement forming an einzel lens (EL) whose focal plane, on the side where the sample surface is located, coincides substantially with said image plane of said intermediate image (BP).

4,551,600

VENTILATED COOKING APPLIANCE UNIT

Junichi Miyagawa, Neyagawa, and Yukio Hirai, Takarazuka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

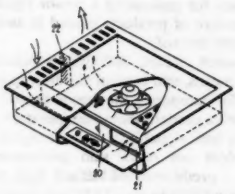
PCT No. PCT/JP83/00117, § 371 Date Dec. 14, 1983, § 102(e) Date Dec. 14, 1983, PCT Pub. No. WO83/03735, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 14, 1983, Ser. No. 567,845

Claims priority, application Japan, Apr. 14, 1982, 57-62741

Int. Cl.⁴ H05B *6/12*; F24C *15/10*

U.S. Cl. 219—10.49 R **4 Claims**



1. A cooking appliance unit, comprising:

(a) a horizontal top plate having a plurality of sides defining an outer periphery and having means for transmitting heat to food items placed thereon;

(b) a horizontal frame formed on each of said plurality of sides of said outer periphery so as to surround said plate; said plate having vertically directed inlet ventilating holes and vertically directed exhaust ventilating holes on only one of said plurality of sides thereof;

(c) a cooking appliance body below said plate and said frame having a plurality of walls defining mutually separated first, second and third chambers enclosed therein, said plurality of walls including a bottom wall having said third chamber directly thereabove, a first inner wall above said bottom wall having said second chamber thereabove, separating said third chamber from said second chamber, and a second inner wall separating said first chamber from said second chamber; said inlet ventilating holes being in fluid communication with said first chamber; said exhaust ventilating holes being in fluid communication with said third chamber; said second inner wall having at least one ventilation opening providing fluid communication between said first and second chamber; said first inner wall having means therein for providing fluid communication between said second and third chamber;

(d) first means for heating said heat transmitting means, disposed in said second chamber;

(e) means for controlling said first heating means, disposed in said first chamber; and

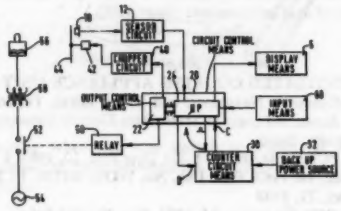
(f) means for drawing a flow of cooling air successively through said inlet holes, said first chamber, said at least one ventilation opening, said second chamber, said means for providing fluid communication between said second and third chamber, said third chamber and said exhaust holes.

4,551,601

HEAT COOKING APPARATUS WITH TEMPERATURE OPERATING SYSTEM

Nobuichi Nishimura, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,752
Claims priority, application Japan, Jul. 11, 1983, 58-125933
Int. Cl.[4] H05B *9/06*
U.S. Cl. 219—10.55 B **18 Claims**



1. A fault indication circuit for a heating apparatus comprising:

(a) a sensor for generating a sensor signal indicative of the temperature of products placed in said apparatus during operation thereof;

(b) a control circuit, including a microprocessor having timing means, said control circuit responsive to said sensor signal for comparing the sensor signal indicative temperature with a predetermined temperature and for generating a sensor fault signal if said sensor signal indicative temperature does not reach said predetermined temperature within a predetermined default time period as timed by said timing means;

(c) an output control means connected to said control circuit and operative to de-energize said heating apparatus when said fault sensor signal is generated;

(d) a counter connected to receive said sensor fault signal for incrementing in response thereto, said counter outputting a sensor defect signal in response to a predetermined number of sensor fault signals; and

(e) output means for outputting an indication of said sensor defect in response to said sensor defect signal.

4,551,602

ELECTRICAL MACHINING USING AN AQUEOUS SOLUTION WITH A RECYCLED SURFACE ACTIVE AGENT

Kiyoshi Inoue, Tokyo; Makoto Onoue, and Sadao Sano, both of Yokohamashi, all of Japan, assignors to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Filed Jun. 21, 1983, Ser. No. 506,448
Claims priority, application Japan, Jun. 23, 1982, 57-108942; Jul. 8, 1982, 57-119105
Int. Cl.[4] B01D *17/00;* **B23P** *1/16*
U.S. Cl. 219—69 D **27 Claims**

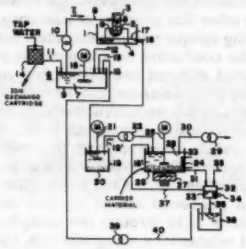
1. A method of processing a machining liquid in an electrical machining system, comprising the steps of:

(a) forming an input machining liquid consisting at least in major part of an aqueous solution containing a non-ionic surface active agent dissolved in deionized water, said surface active agent having a temperature-dependent solubility in the solution and a cloud point of temperature below which it remains dissolved therein;

(b) supplying said input machining liquid to an electrical machining zone whereby at least a volume portion of the supplied liquid serves as a medium for an electrical machining action therein;

(c) feeding a liquid effluent from said machining zone, constituted by residual volume portions of said deionized water and said surface active agent remaining in the solution having electrical machining products entrapped therein, into a separation zone;

(d) in said separation zone, heating said liquid effluent to, and maintaining it at, a temperature sufficiently above a said cloud point thereof to separate therefrom an amount of



said surface active agent substantially in a solid form while forming a liquid constituted by at least a portion of the remainder of said liquid effluent; and

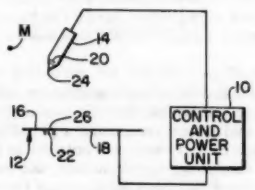
(e) recycling said separated surface active agent at least as a portion of the surface active agent in said input machining liquid into a said electrical machining zone.

4,551,603

DEVICE AND METHOD FOR SURFACING A WORKPIECE

Isadore J. Rocklin, 3240 Douglas St., Sioux City, Iowa 51104

Continuation-in-part of Ser. No. 900,245, Apr. 26, 1978, abandoned, which is a continuation of Ser. No. 721,831, Sep. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 550,824, Feb. 18, 1975, which is a continuation-in-part of Ser. No. 332,216, Feb. 13, 1973, Pat. No. 3,878,351, which is a division of Ser. No. 451,059, Mar. 14, 1974, abandoned, which is a division of Ser. No. 130,734, Apr. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 386,189, Aug. 6, 1973, Pat. No. 3,969,601. This application Aug. 9, 1984, Ser. No. 639,112
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.13 **47 Claims**



1. A method of surfacing a metal workpiece comprising steps of:

establishing an electrostatic potential between the metal workpiece and the electrode;

controlling the electrostatic potential between the electrode and the workpiece to a level which is essentially equal to that potential associated with glow discharge and less than that potential associated with arc welding;

contacting the electrode to the metal workpiece at a selected location;

withdrawing the electrode from the workpiece to create a spark arc prior to any significant current flow between the electrode and the workpiece to prevent current heating of the metal workpiece;

moving the electrode out of contact with the metal work-

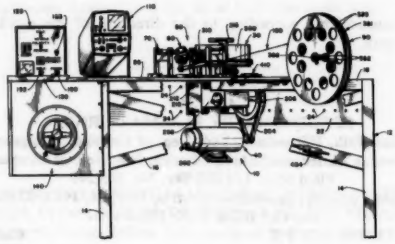
piece to a position in which the spark arc is extinguished; and

then again contacting the electrode to the metal workpiece a second time.

4,551,604
METHOD AND APPARATUS FOR FABRICATING HONEYCOMB SEAL

James R. Campbell, South Laguna, Calif., assignor to Thomas P. Mahoney, Balboa Island; Donald A. Ruston and Robert S. Barnes, both of Newport Beach, all of, Calif., a part interest to each

Filed Jun. 13, 1983, Ser. No. 503,542
Int. Cl.[4] B23K *11/06, 11/32*
U.S. Cl. 219—78.12 **34 Claims**



1. A welding apparatus for fabricating a circular honeycomb-type seal from a continuous preformed metallic strip having male and female nodes, comprising: continuous strip supply means; a cylindrical, strippable forming means juxtaposed to said strip supply, said forming means being conductive and adapted to orient said strip into the circular configuration of said seal as successive laminae of said strip are wound thereabout by rotation of said forming means; welding head means located tangentially of the perimeter of said forming means and engageable with the uppermost lamina of said strip to weld it to the adjacent lamina, said welding head means being driven by engagement with the successive nodes of said metallic strip as caused by rotation of said strip induced by rotation of said forming means; and a welding circuit connected to said welding head means and to said forming means to successively weld the respective adjacent laminae of said strip to each other.

31. The method of fabricating a circular, honeycomb-type seal from a continuous pre-formed strip having alternate male and female nodes, comprising: forming said strip into a circular configuration on a cylindrical, conductive form with said male and female nodes juxtaposed to one another to permit the weldment thereof; simultaneously welding a plurality of said nodes to each other by engaging only the uppermost of said nodes during rotation of said form; and stripping said seal from said form upon completion of said seal.

4,551,605
GUN ARM APPARATUS FOR RESISTANCE WELDING GUN

Morikuni Numata, Ageo, and Toshihiko Nakadate, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

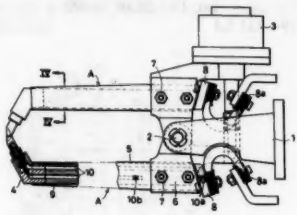
Filed Dec. 27, 1983, Ser. No. 566,071
Claims priority, application Japan, Dec. 27, 1982, 57-195610[U]; Dec. 27, 1982, 57-195611[U]
Int. Cl.[4] B23K *11/10*
U.S. Cl. 219—86.31 **5 Claims**

1. A gun arm for a resistance welding gun, said gun arm comprising:

(a) a main body;

(b) an electrode holder mounted on the front portion of said main body;

(c) a support member fixed to the rear portion of said main body; and



(d) said main body comprising conductor plate means having a water passage means on at least one side thereof and body plate means fixed to said at least one side of said conductor plate means and in contact with said water passage means.

4,551,606
BEAMED ENERGY RADIATION CONTROL METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed May 26, 1983, Ser. No. 498,177
Int. Cl.[4] B23K *15/00, 26/00*
U.S. Cl. 219—121 EA **10 Claims**

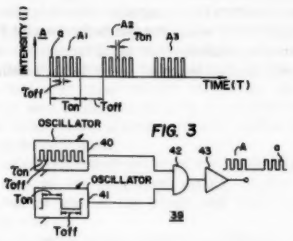


FIG. 3

1. A method of controlling beamed energy radiation onto a workpiece, comprising:

producing a beamed energy flow in the form of a series of successive, time-spaced beam groups each of which groups comprises a succession of time-spaced energy beams with a beam on-time τon and a beam off-time τoff for irradiation of the workpiece, said successive beam groups having each individually a time duration Ton and being separated by a time interval Toff which is greater than said beam off-time τoff; and

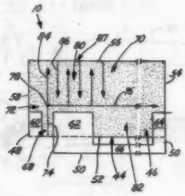
controlling said beamed energy flow being radiated onto the workpiece by controlling at least one of said on-time τon, said off-time τoff, said time duration Ton, said time interval Toff and the number n of the time-spaced energy beams in each of said successive groups.

4,551,607

ELECTRICAL FILM RESISTOR

Alexander Moy, Evanston, Ill., assignor to Beltone Electronics Corporation, Chicago, Ill.

Filed Apr. 30, 1984, Ser. No. 605,612
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LJ **5 Claims**



1. A process for making a film resistor having first and second terminals comprising, in combination, the steps of:

applying a first electrode to an electrically non-conductive substrate, said first electrode defining a first terminal;

applying a second electrode to said substrate at a first predetermined distance from said first electrode;

applying a third electrode to said substrate at a second predetermined distance from said first electrode, said second predetermined distance being greater than said first predetermined distance; electrically interconnecting said second and third electrode apart from said substrate, said second and third electrodes cooperatively forming said second terminal, said first electrode being substantially electrically isolated from both said second and third electrodes;

applying an electrically resistive film to said non-conductive substrate, said resistive film being in contact with said first, second, and third electrodes;

selectively removing, in a predetermined pattern, said resistive film from said substrate between said first and second electrodes, whereby electrical resistance between said first and second terminals is gradually increased, until said second electrode is substantially electrically isolated from said first electrode; and

selectively removing, in a predetermined pattern, said resistive film from said substrate between said first and third electrodes, whereby electrical resistance between said first and second terminals is further gradually increased.

4,551,608

MATERIAL WORKING APPARATUS

Hans Opower, Krailling, Fed. Rep. of Germany, assignor to W.C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

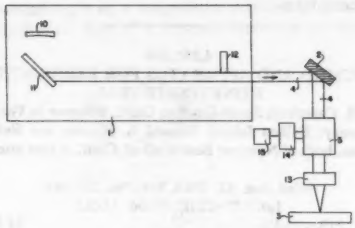
Filed May 10, 1984, Ser. No. 608,992
Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317022
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 L **3 Claims**

1. A combination for working materials, comprising:

a laser having an unstable optical resonator, including cylindrical mirrors, for emitting an optical laser beam;

at least one additional mirror for deflecting said optical beam onto a workpiece; and

image-rotating means disposed in said optical beam and including an uneven number, but at least three, fully reflective mirrors, the angle of rotation of said image-rotating means about the optical beam axis being electronically



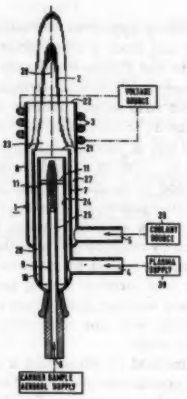
controllable according to the direction of the working path.

4,551,609

SPECTROMETRY PLASMA BURNER

Gertrud Falk, Röttenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,249
Claims priority, application Austria, Mar. 24, 1983, 3310742
Int. Cl.⁴ B23K *9/00;* **H01J** *7/24*
U.S. Cl. 219—121 PR **7 Claims**



1. In a device used in spectrometry for exciting a chemical element to emit electromagnetic radiation, said device having an outer jacket, an inner jacket coaxial therewith, an axially disposed capillary tube, a first feed line for conveying plasma gas, a second feed line for conveying cooling gas, a third feed line for conveying aerosol including the chemical element to be excited, and an induction coil wound around the outer jacket at one end thereof for generating the plasma,

the improvement comprising insulating means for forming a dead space surrounding said capillary tube, said insulating means including a sleeve disposed between the capillary tube and the inner jacket, said sleeve being coaxial with the outer jacket, said inner jacket and said capillary tube, said sleeve being radially spaced from said capillary tube to form said dead space therewith, said insulating means further including a solid ring for centering said sleeve with respect to said capillary tube and for closing off said dead space at an end thereof proximate to the induction coil, said ring engaging said sleeve at an inner surface thereof and said capillary tube at an outer surface thereof.

4,551,610

TUBULAR WELDING ELECTRODE

Mario A. Amata, Chardon, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed May 17, 1983, Ser. No. 495,577
Int. Cl.[4] B23K *35/362*
U.S. Cl. 219—146.3 **14 Claims**

1. An arc welding electrode comprised of a tube of low carbon steel having on the inside thereof as major ingredients, as percentage of total electrode weight:

Lithium oxide (LiO_2): 1.8–3.2%

One or more amphoteric oxides selected from the class consisting of Fe_xO_y and Mn_xO_y: 6.0–23%

Aluminum: 2.5–5.0%

Magnesium: 0.2–2.2%

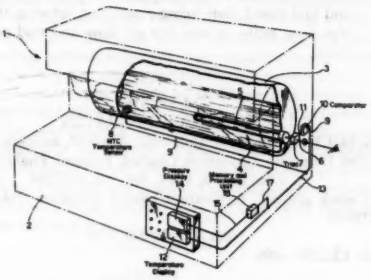
the lithium oxide being present in a sintered composite with the amphoteric oxide(s) in a one to at least one mole ratio.

4,551,611

ESPRESSO COFFEE MACHINE CONTROL SYSTEM DISPLAYING BOILER TEMPERATURE AND PRESSURE

Walter G. Longo, Milan, Italy, assignor to Nuova Faema S.p.A., Milan, Italy

Filed Apr. 10, 1984, Ser. No. 598,686
Claims priority, application Italy, Apr. 14, 1983, 21543/83[U]
Int. Cl.[4] H05B *1/02;* **A47J** *31/30, 31/56;* **F24H** *1/20*
U.S. Cl. 219—308 **1 Claim**



1. In an espresso coffee machine of the type having a boiler and heating means associated with the boiler for heating the water contained in the boiler, the improvement comprising a temperature transducer fitted within the boiler and providing a temperature output signal, said transducer being a negative temperature coefficient type (NTC) resistance, activating means responsive to said output signal for activating said heating means, said means for activating the heating means including a comparator unit fed by the said temperature output signal and with the extreme values of a temperature range, to compare said signal with these extremes, said comparator unit controlling activation and deactivation of said heating means,

display means fed by said signal to continuously display the temperature of the water in the boiler,

a memory and processing unit having stored therein the Mollier diagram curve relating to saturated water vapour, said memory and processing unit being continuously fed with the said temperature output signal to continuously output the value of the corresponding pressure, and

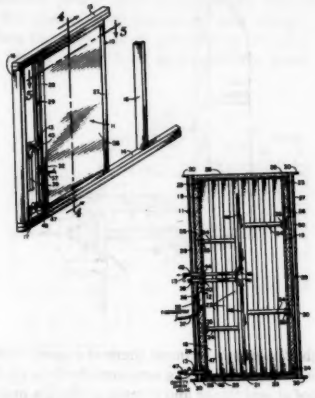
display means fed with said pressure value for the display thereof.

4,551,612

WALL-CONTAINED ELECTRIC WATER HEATING TANK

William H. Sprague, R.R. #1, Box 264, Mead, Wash. 99021

Filed Jan. 30, 1984, Ser. No. 575,001
Int. Cl.[4] F24H *1/20;* **H05B** *3/82;* **B65D** *6/38*
U.S. Cl. 219—312 **2 Claims**



1. In an electrically powered reservoir type water heating tank the invention comprising, in combination:

a relatively thin peripherally insulated tank structure having a rectilinear configuration and dimensioned to be contained in a void defined within a structural wall between the upper and lower plates, opposing surface elements and a pair of spaced vertical studs of the structural wall, said tank having

two spaced opposed vertical sides of substantial areal extent with vertically extending flutes therein to provide rigidity,

two elongate rectilinear ends structurally joining the vertical edges of said sides in spaced relationship, and

rectilinear planar top and bottom elements structurally communicating with said sides and ends to define a chamber for containment of water, said tank being supported by said bottom element from vertical displacement;

relatively thin rigid insulation covering the periphery of the tank to lessen thermal transfer therefrom, the external surface of said insulation defining a structure no larger than the void within a structural wall within which the tank is to be contained;

structural brackets extending laterally from the vertical ends of the tank to the peripheral surface of the insulation thereabout, at least at the upper and lower portions of each end; and

vertically oriented post-like studs, structurally carried by the lateral extensions of said brackets at each vertical end of the tank, with each stud having fastening brackets extending laterally therefrom to aid the fastening of the tank within a wall.

4,551,613

RAPID-HEATING ELECTRIC WATER BOILER

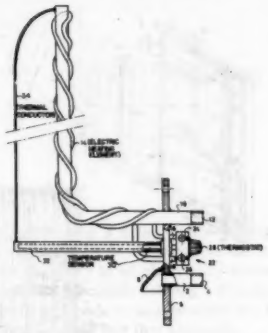
Yechiel Yashfe, 37 Nikanor St., Jerusalem, Israel

Filed Sep. 12, 1983, Ser. No. 531,299
Int. Cl.[4] H05B *1/02, 3/82;* **F24H** *1/20*
U.S. Cl. 219—316 **12 Claims**

1. A rapid-heating device for an electric water boiler having an access opening in the lower portion thereof, comprising:

(a) a flange adapted to close the access opening in the lower portion of an electric water boiler when the flange is attached to said boiler;

(b) a cold-water inlet pipe passing through said flange;
(c) a hot water outlet pipe having a lower end passing through said flange and a free end adapted to terminate adjacent the top of the boiler when the flange is attached thereto; and
(d) a water-immersible, wetted electrical heating element



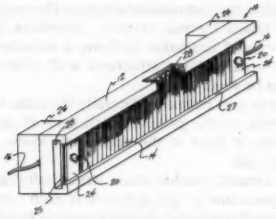
attached to and in intimate thermal contact with said hot water outlet pipe starting substantially from the lower end thereof at said flange and extending along a major portion of the length of said outlet pipe towards the free end thereof for simultaneously heating both water contained inside said hot water outlet pipe as well as water surrounding said hot water outlet pipe.

4,551,614

ELECTRICAL RESISTANCE HEATER UNIT

Joe P. Johnson, 113 Cypress Dr., Inman, S.C. 29349

Filed Jul. 13, 1984, Ser. No. 630,847
Int. Cl.[4] F24H *3/00*; H05B *1/00*; H01C *3/10, 7/22*
U.S. Cl. 219—355 **11 Claims**



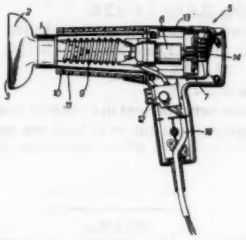
1. An improved high intensity electrical resistance heater unit comprising an elongate thin metal foil ribbon adapted to be heated by passage of electricity therethrough to a high temperature for radiation of heat therefrom, a thermally insulating rigid backing of low electrical conductivity for supporting said ribbon, said backing having an elongate channel formed in a front face thereof for receiving the ribbon, sides of the channel being undercut to form side grooves, and longitudinal side edge portions of the ribbon being received in said side grooves of the channel to frictionally support and retain the ribbon along its length within the channel while leaving the major surface of the ribbon unobstructed to permit unrestricted heat radiation therefrom.

4,551,615

GUARD FOR HOT AIR GUN

Peter H. Wilson, Stockton-on-Tees, England, assignor to Black & Decker Inc., Newark, Del.

Filed May 1, 1984, Ser. No. 605,801
Claims priority, application United Kingdom, May 5, 1983, 8312378
Int. Cl.[4] F24H *3/04*; H05B *1/00, 3/02*
U.S. Cl. 219—373 **13 Claims**



1. A hot air gun, comprising:
a housing having an outlet for a flow of hot air therefrom;
a guard plate in the vicinity of said hot air outlet, said guard plate being connected to said housing;
said guard plate having a straight edge transverse to the general direction of said hot air flow, said straight edge being located downstream from said outlet and defining the downstream extremity of said guard plate;
said guard plate defining in use part of the boundary of said hot air flow from said outlet; and
a cooling air outlet for a flow of cooling air therefrom, said cooling air outlet being disposed around said hot air outlet and said guard plate being positioned between the respective flow paths of said hot air flow and said cooling air flow.

4,551,616

HEATING APPARATUS

Michael H. C. Buttery, Tadworth, England, assignor to Thorn Emi Domestic Appliances Limited, London, England

Filed Jul. 6, 1984, Ser. No. 628,504
Claims priority, application United Kingdom, Jul. 7, 1983, 8318457
Int. Cl.[4] H05B *3/68*
U.S. Cl. 219—460 **6 Claims**

1. A cooking hob comprising a housing having a base, side walls and an upper surface, said upper surface being formed from glass ceramic material; a heating unit; means for mounting said heating unit in said housing adjacent the underside of said glass ceramic surface; said heating unit comprising a tray member, a layer of thermally-insulative material accommodated in said tray member, an infra-red lamp, and means for mounting said lamp above said layer of thermally-insulative material; said lamp comprising a generally tubular envelope, a filament contained within said envelope, first and second electrical connections connected respectively to each end of said filament, and first and second pinch seals having respectively said first and second electrical connections sealed therein; electrical coupling means for coupling said first and second electrical connections to a power supply; a hollowed member,

formed with aperture placing the ambient environment of said hob in communication with the interior of said hob; said base being apertured, at least in a region beneath said pinch seals, whereby air is encouraged to flow into said housing via said apertured base, around said pinch seals, and out of said housing via said hollowed member.

4,551,617

HEATING APPARATUS

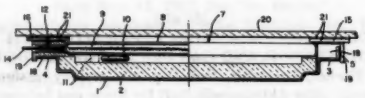
Peter W. Crossley, Havant, and Robert D. Smith, Cheshunt, both of England, assignors to Thorn EMI Domestic Appliances Limited, London, England

Filed Jun. 15, 1984, Ser. No. 621,209

Claims priority, application United Kingdom, Jun. 15, 1983, 8316306

Int. Cl.⁴ H05B *3/68*

U.S. Cl. 219—464 **7 Claims**



1. Heating apparatus mounted beneath a glass ceramic layer of a cooking hob, said apparatus including an infra-red lamp and thermally-insulative material below said lamp, and support means supporting said lamp and said thermally-insulative material in a desired location relative to each other and to said glass ceramic layer, said lamp comprising a generally tubular envelope formed from an electrically-insulative and thermally-conductive material, a filament supported within said envelope, first and second pinch seals formed integrally with said envelope and closing respective ends of said envelope, electrical connections to respective ends of said filament sealed within said pinch seals, and first and second thermally-conductive ceramic housings substantially enclosing respectively said first and second pinch seals, said apparatus being adapted to constrain thermal radiation generated by said lamp to a predetermined region of said glass ceramic layer, said apparatus further including first and second thermally-conductive members located respectively in thermal contact with said ceramic housings and an undersurface of said glass ceramic layer so as to conduct heat, from said pinch seals in a substantially upward direction towards a region of said glass ceramic layer outside of said predetermined region.

4,551,618

COOKING APPLIANCE INCORPORATING HEATER ENERGY COUNTER MEANS

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 334,039, Dec. 23, 1981, abandoned. This application Nov. 2, 1982, Ser. No. 438,622

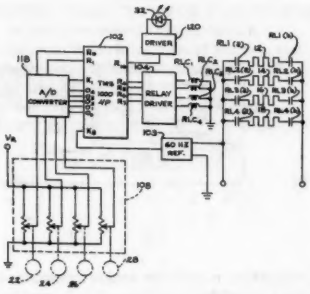
Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—510 **26 Claims**

1. An arrangement for monitoring the approximate temperature of a resistive heating element adapted for selective energization by a power signal from an external power supply at one of a plurality of power levels ranging from relatively low power levels, including an OFF level, to relatively high power levels, the heating element having a temperature response characterized by a transient heat-up phase followed by a steady state phase when the power level is changed from OFF to some other power level; and by a transient cool-down phase when the power level is changed from a relatively higher power level to a relatively lower power level, the temperature monitoring arrangement comprising:

energy counter means for approximately tracking the heating element temperature and

counter control means operative to selectively increment said energy counter means at an increment rate which is approximately proportional to the rate of increase of the heating element temperature during the heat-up phase for the applied power level, and to discontinue incrementing said energy counter means when said count at least equals a predetermined maximum count which is approximately proportional to the steady state heating element temperature for the selected power level; said counter control means being further operative to decrement said energy counter means when the power level selection is changed from a relatively higher power level to a relatively lower power



level at a decrement rate which is approximately proportional to the rate of decrease of the heating element temperature during its cool-down phase, and to discontinue decrementing sdid energy counter means when said count is less than a predetermined maximum count which is approximately proportional to the steady state operating temperature of the heating element at the selected relatively lower power level;

whereby the count of said energy counter means is approximately proportional to the temperature of the heating element. during the heat-up, steady state and cool-down phases of heating element operation.

4,551,619

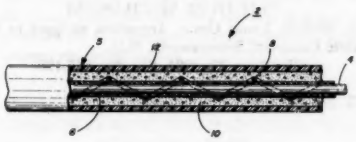
CABLE STRUCTURE FOR IMMERSION HEATERS OR THE LIKE

Fredrick L. Lefebvre, 700 Solano Prado, Coral Gables, Fla. 33156

Filed Jan. 22, 1985, Ser. No. 693,149

Int. Cl.⁴ H05B *3/06*

U.S. Cl. 219—523 **12 Claims**



1. A flexible cable structure having a maximum diameter of $\frac{1}{4}$ inch adapted for use as an electric immersion heater having good temperature and corrosion resistent characteristics with the ability to be bent to a minimum radius, comprising an electric heater wire element adapted for connection to a power source, a sheath made from a relatively thin layer of fluoropolymeric material disposed in close fitting relation around said heater wire element throughout its length thereof, a conductive ground wire element disposed in spiral engagement with and extending substantially throughout the length of said sheath, an insulating barrier layer of high temperature insulation encapsulating said ground wire element substantially

throughout its length thereof, and an outer tubular sheath made from a fluoropolymeric material disposed in encapsulating relation around said insulating barrier layer substantially throughout its length thereof to provide said cable structure.

4,551,620

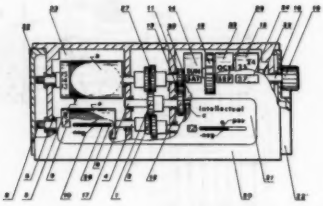
BIORHYTHMS ANALOG COMPUTER-CALENDAR

Michael Rashev, 40 W. 72nd St., Apt. 31B, New York, N.Y. 10023

Filed Jun. 29, 1982, Ser. No. 393,398

Int. Cl.⁴ G04B *19/21;* **G06C** *3/00;* **G09D** *3/00;* **G01D** *13/08*

U.S. Cl. 235—1 C **7 Claims**



1. A biorythms multicycle analog computer-calendar displaying the level of the biorythms of the human body, comprising:

a housing having at least one display window arranged to indicate at least one cycle of the human biorythms;

three rotationally symmetrical bodies having driving means to rotate within said housing with fixed axes of rotation, each body comprising on its surface a closed loop curve to enclose said fixed axis of rotation;

a calendar date arrangement to correllate in time the angular position of said rotationally symmetrical bodies;

an actuating means to actuate in parallel the angular position of said bodies and said calendar date arrangement;

a synchronizing means to synchronize the angular position of said rotationally symmetrical bodies and said calendar date arrangement;

wherein each closed loop curve disposed on the surface of each body during its rotation projects through said at least one display window different parts of said curve, thus to constitute in time a sinusoidal-like mode of alteration of one of the biorythms of the human body and to correlate it to a given calendar time by means of said calendar date arrangement.

4,551,621

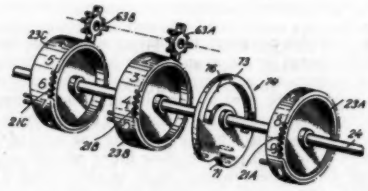
FLIP-OVER MECHANISM

Julio J. Bianchi, Lanus Oeste, Argentina, assignor to General Electric Company, Somersworth, N.H.

Filed Nov. 27, 1984, Ser. No. 675,190

Int. Cl.⁴ G06C *27/00*

U.S. Cl. 235—117 R **11 Claims**



1. A flip-over mechanism for a cyclometer register of a type including at least first and second cyclometer drums rotatable on a drum shaft and a carry pinion for incrementing said second cyclometer drum, comprising:

means for permitting said first cyclometer drum to be driven by an external device;

a fly-wheel on said drum shaft;

means on said fly-wheel for providing a predetermined amount of imbalance therein;

engaging means on said first cyclometer drum and said fly-wheel for concertedly rotating said fly-wheel by said first cyclometer drum during a predetermined portion of a rotation of said first cyclometer drum;

said engaging means including means for pemitting said fly wheel to perform a free forward rotation upon said shaft at a predetermined point in a rotation of said first cyclometer drum; and

said fly-wheel including means for momentarily urging said carry pinion at an end of said free forward rotation whereby a substantially instantaneous carry is provided.

4,551,622

DOCUMENT SCANNING APPARATUS WITH PHOTOSENSOR AND GAS DISCHARGE READOUT

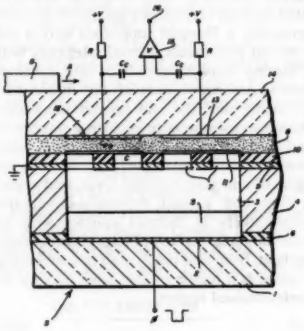
Dieter Fischer, Frankfurt, Fed. Rep. of Germany, assignor to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik, Nurnberg, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,660

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212302

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 R **3 Claims**



1. An apparatus for reading a relatively movable illuminated document comprising a line array of light responsive elements extending perpendicular to the direction of movement of said document, each of said light responsive elements comprising,

a photo conductive layer having on a first side exposed to light reflected from said illuminated document a non-transparent output electrode and a transparent ouput electrode,

a ground electrode spaced by an insulating layer from a second side of said photoconductive layer opposite from said first side,

said ground electrode and said insulator layer having aligned perforations defining gas gaps,

a gas discharge triggering electrode, and

means defining a gas discharge chamber bounded by said triggering electrode and said ground electrode and said second side of said photoconductor via said gas gaps,

a source voltage connected across said output and ground electrodes,

means for supplying a voltage pulse to said triggering electrode to initiate a gas discharge in said gas discharge chamber whereby the discharge in said gas gaps effectively grounds the second side of said photoconductive

layer and said photoconductive layer charges to said source voltage from lower voltage levels corresponding to exposure to light in intervals between successive gas discharges,

a differential amplifier, and

means connecting the transparent and non-transparent electrodes to the input of said differential amplifier whereby an information signal at the output of said differential amplifier will be substantially free of transient and dark currents.

4,551,623

PHOTOCONDUCTIVE DETECTOR WITH AN A/C BIAS AND RESPONSIVITY DEPENDENT UPON THE POLARITY OF THE BIAS

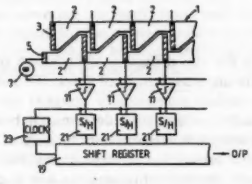
Charles T. Elliott, and Anthony M. White, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 15, 1982, Ser. No. 441,867

Claims priority, application United Kingdom, Dec. 7, 1981, 8136751

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 R **10 Claims**



1. A photoconductive detector apparatus including:

at least one photocondutive element arranged for a responsivity change with a change in bias voltage polarity,

an AC bias source arranged for biassing said at least one photoconductive element, and

an output circuit arraged to provide a response to a photoconductive element output signal component differing in frequency from that of the AC bias source.

4,551,624

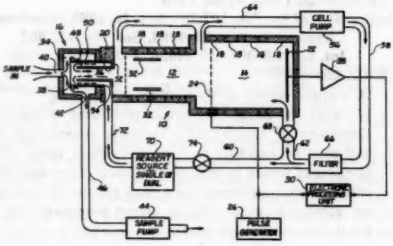
ION MOBILITY SPECTROMETER SYSTEM WITH IMPROVED SPECIFICITY

Glenn E. Spangler, Lutherville, and John N. Cox, Baltimore, both of Md., assignors to Allied Corporation

Filed Sep. 23, 1983, Ser. No. 535,451

Int. Cl.⁴ B01D *59/44*; G01N *27/66*

U.S. Cl. 250—287 **34 Claims**



1. In an ion mobility spectrometer wherein a sample gas or vapor having at least one constituent to be detected and a carrier gas are injected into a reaction chamber thereof, and wherein the sample gas contains contaminants which reduce the specificity of the ion mobility spectrometer to the at least one constituent to be detected, an improvement characterized by:

at least one reagent source for introducing a reagent into the carrier gas prior to being injected into the ion mobility spectrometer, and

a reagent having a higher proton affinity, electron affinity, or acidity than said contaminants, a lower proton affinity, electron affinity, or acidity than said at least one constituent to be detected, and which does not cluster with water disposed in said reagent source.

4,551,625

SPECTROMETER OBJECTIVE FOR PARTICLE BEAM MEASUREMENT TECHNIQUE

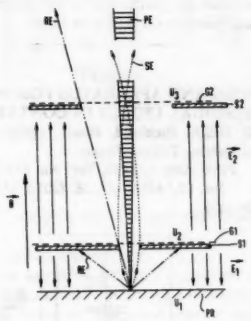
Burkhard Lischke, and Erich Plies, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,605

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236271

Int. Cl.⁴ H01J *37/26*

U.S. Cl. 250—310 **10 Claims**



1. An improved arrangement for particle beam potential measurement having an electron probe objective lens for imaging primary particles on a specimen and a spectrometer for detecting secondary particles released from said specimen, the improvement comprising a first electrode means adjacent said specimen for accelerating said secondary particles and for focusing secondary particles along an optical axis, a second electrode means above said first electrode means for determining energy selection based on secondary particles passing along said optical axis, means for adjusting the voltage of the second electrode means which is in combination with a magnetic field of said objective lens between said first and second electrode means for focusing and retarding secondary particles on said second electrode means.

4,551,626

METHOD OF CORRECTING RADIATION IMAGE READ-OUT ERROR

Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1984, Ser. No. 618,859

Claims priority, application Japan, Jun. 9, 1983, 58-103067

Int. Cl.⁴ G03C *5/16*

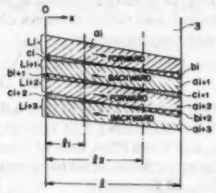
U.S. Cl. 250—327.2 **5 Claims**

1. A method of correcting a radiation image readout error comprising the steps of:

(i) scanning a stimulable phosphor sheet carrying a radiation transmission image stored therein by stimulating rays in forward and backward main scanning directions by use of galvanometer mirrors,

(ii) photoelectrically detecting light emitted from said stimu-

lable phosphor sheet upon stimulation thereof by said stimulating rays scanning in the forward and backward main scanning directions and converting the emitted light into an electric image signal of said radiation transmission image at each position on scan lines in the forward main scanning direction and in the backward main scanning direction, and



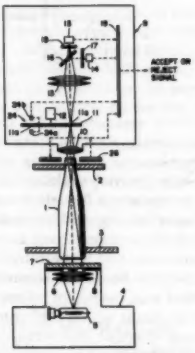
(iii) correcting said electric image signal by use of a correction coefficient predetermined for each position on said scan lines in the forward main scanning direction and in the backward main scanning direction in accordance with the deviation in position in a sub-scanning direction at each said position on said scan lines.

4,551,627

METHODS AND APPARATUS FOR DETECTING RESIDUAL LIQUID IN CONTAINERS

Frederich R. Reich, Richland, Wash., assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 518,934
Int. Cl.⁴ G01F *23/28*; G01J *5/48*
U.S. Cl. 250—339 **9 Claims**



1. A method for detecting residual oil coexisting with water in a container, comprising the steps of:

(a) measuring optical transmittances of a combination of oil to be detected and a container wall and a combination of water coexisting with the oil to be detected and a container wall;

(b) selecting two optical pass-bands, one of which is relatively high transmittance level with respect to combination of the oil and the container wall while the other of which is relatively low transmittance level with respect to the same, and each of which is almost equal in transmittance level to each other with respect to the combination of water coexisting with the oil to be detected and the container wall;

(c) measuring light quantities at the two optical pass-bands when light passes through the bottom and necks of the container;

(d) converting the light quantities into respective two electric signals; and

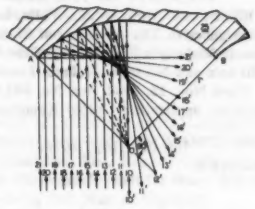
(e) comparing one electric signal with respect to one pass-band with the other electric signal with respect to the other pass-band.

4,551,628

RADIATION DISPERSING CAVITIES

Jack J. Grossman, Manhattan Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 1, 1983, Ser. No. 481,164
Int. Cl.⁴ G01N *21/24*
U.S. Cl. 250—503.1 **21 Claims**



1. A cavity for the diffusion of radiation of a bandwidth having a maximum wavelength of about 100 microns comprising a cavity surface substantially covered by a plurality of interlocking deformations, each deformation being a surface of revolution whose axis is substantially normal to the cavity surface wherein the surface of revolution is formed by a conic such that a cross section containing the axis is a portion of the conic subtending an arc of from 10° to about 140° measured from the focus of the conic and the arc having an effective diameter measured across the end points of the arc wherein the ratio of the longest wavelength in the bandwidth to the arc diameter of a deformation is less than one-fifth and wherein the diameter of the cavity is at least five times the arc diameter of a deformation, wherein the cavity surface is characterized by a specific reflectivity for the bandwidth of the radiation wherein the cavity comprises an enclosed surface having at least one aperture to serve as inlet and outlet apertures such that a Lambertian distribution of radiation is produced and is accessible at the outlet aperture.

4,551,629

DETECTOR ARRAY MODULE-STRUCTURE AND FABRICATION

John C. Carson, Corona Del Mar, and Stewart A. Clark, Huntington Beach, both of Calif., assignors to Irvine Sensors Corporation, Costa Mesa, Calif.

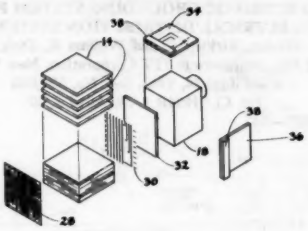
Continuation of Ser. No. 187,787, Sep. 16, 1980, abandoned. This application Jan. 23, 1984, Ser. No. 572,802
Int. Cl.⁴ G06K *9/28*; H05K *3/06*; H01L *21/90*
U.S. Cl. 250—578 **8 Claims**

1. A photo-detector array module comprising:

a plurality of integrated-circuit-providing semiconductor substrates of substantially identical dimensions stacked and secured together to form a multiple layer structure, one end of which terminates in a focal plane and the other end of which terminates in a back plane, the semiconductor substrates extending in layers perpendicular to the focal plane and back plane;

the focal plane end of each substrate having thereon a multiplicity of closely spaced electrical contact points provided by the ends of the metal leads formed as part of the integrated circuitry on the substrate, the electrical contact points on the focal plane end of each semiconductor substrate having a predetermined substantially exact spatial

relationship with the electrical contact points on the focal plane end of the other stacked semiconductor substrates;
insulation layers between adjacent substrates to insulate the body of each substrate from adjacent substrates in the stack;
insulation covering the entire focal plane end of the stacked substrates except for the contact points thereon, and preventing current leakage between the contact points and the focal plane ends of the substrates;
the back plane end of each substrate having a multiplicity of electrical contact points thereon; and
insulation covering the back plane end of the stacked substrates except for the contact points thereon, and preventing current leakage between the contact points and the back plane ends of the substrates.

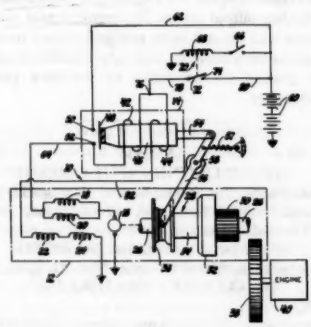


4,551,630

ELECTRIC STARTING SYSTEM

Daniel W. Stahura, Anderson, and Daniel D. Richey, New Castle, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 31, 1984, Ser. No. 615,799
Int. Cl.[4] H02P 9/04
U.S. Cl. 290—38 R **4 Claims**



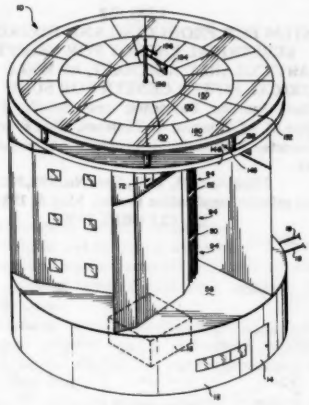
1. An electric starting system for cranking an engine comprising, a source of direct voltage, an electric cranking motor having an armature, a series field winding and a shunt field winding, a shaft driven by said armature carrying a pinion that is adapted to be meshed with the ring gear of an engine to be cranked, a solenoid having a pull-in coil, a hold-in coil and a shiftable plunger, means connecting said plunger and pinion such that shiftable movement of said plunger causes said pinion to shift, a start switch, means connecting one side of said start switch to a first side of said voltage source, a first circuit connected between the opposite side of said start switch and a second side of said voltage source comprising in a series connection said solenoid hold-in coil and said shunt field winding, and a second circuit connected between said opposite side of said start switch and said second side of said voltage source, said second circuit connected in parallel with said first circuit and comprising in a series connection, said solenoid pull-in coil, said series field and the armature winding of said armature.

4,551,631

WIND AND SOLAR ELECTRIC GENERATING PLANT

Gaetano T. Trigilio, 5090 Arch St., Maple Hts., Ohio 44137

Filed Jul. 6, 1984, Ser. No. 628,271
Int. Cl.[4] F03D 9/00, 7/06
U.S. Cl. 290—55 **18 Claims**



1. A wind energy collection and conversion system, comprising:
(a) a base having a periphery;
(b) a turbine assembly rotatably supported on said base and said turbine assembly including a plurality of wind current engaging vanes so that wind current impinging on said vanes causes said turbine assembly to rotate;
(c) generator means operably connected to said turbine assembly for generating electric power while said turbine assembly is rotating;
(d) a plurality of support members spaced from said turbine assembly proximate said periphery and said support members extending upwardly generally from said base and generally parallel to the axis of rotation of said turbine assembly;
(e) a plurality of shutter assemblies spaced from said turbine assembly, each of said shutter assemblies disposed between and adjacent two of said support members;
(f) each of said shutter assemblies including a plurality of pivotal shutter means and the shutter means of a shutter assembly are mutually positionable between an open and a closed position for regulating the wind current flowing between the associated support members toward said turbine assembly;
(g) pivot drive means operably interconnecting each shutter means of a shutter assembly for simultaneously pivoting the shutter means of a shutter assembly and for thereby mutually positioning the shutter means of a shutter assembly between the open and closed positions;
(h) wind current direction sensing means;
(i) control means operably associated with said wind current direction sensing means and with each of said pivot drive means for causing the shutter means of each shutter assembly to be selectively positioned between the open and closed positions based upon the direction of the wind current and for thereby regulating the speed of rotation of said turbine assembly;
(j) a wall assembly outwardly extending a substantial dis-

tance from each of said support members for intercepting wind currents and for directing the wind currents generally towards an associated shutter assembly and said wall assemblies extending generally tangential to said periphery; and,

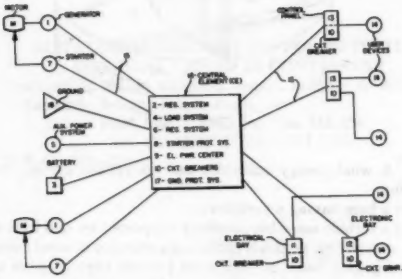
(k) a roof assembly connected to an upper end portion of said wall assemblies and substantially spanning the distance between said wall assemblies so that wind currents intercepted by said wall assemblies are directed toward said shutter assemblies.

4,551,632

SYSTEM FOR PRODUCING AND DISTRIBUTING ELECTRICAL ENERGY FOR VEHICLES PARTICULARLY AIRCRAFT, AS WELL AS AN ELECTRICAL POWER CENTER FOR SUCH A SYSTEM

Jean-Marie Jourdan, Puyricard; Jean Betelle, Toulouse, and Philippe M. M. Bougon, Le Tholonet, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 25, 1983, Ser. No. 488,345
Claims priority, application France, May 5, 1982, 82 07812
Int. Cl.[4] H02G *3/08*
U.S. Cl. 307—9 **11 Claims**



1. In a system for producing and distributing electrical energy for aircraft having at least two motors, said system comprising at least two main generators of D.C. or A.C. type moved by the motors of the aircraft, at least one storage battery, starters for said motors, an electrical power centre formed by primary bars supplied from said main generators, primary contactors and primary circuit breakers, an assembly of secondary bars supplied from the primary bars, secondary contactors and secondary circuit breakers, an assembly of relay boxes and electrical bays, an assembly of electronic bays, control panels, user devices, as well as a plurality of regulating and/or protecting means for the generators, the battery and the starters, the improvement comprising a central unit grouping together said electrical power centre, a part of said assembly of circuit breakers and secondary contactors, and said regulating and/or protecting means, the rest of said assembly 10 of circuit breakers and secondary contactors being distributed bewteen the assembly of relay boxes and electrical bays, the assembly 12 of electronic bays and each of the control panels,

said central unit comprising:

as many primary bars of normal supply as there are generators, each of said primary bars of normal supply being supplied by one generator through means for protecting the latter and supplying at least one secondary bar of normal supply through a first primary circuit breaker;

a primary bar of essential and emergency supply connected to said battery through means for protecting and regulating the latter and to each of said primary bars of normal supply by a plurality of primary contactors and supplying a plurality of secondary bars of essential and emergency supply through the second primary circuit breakers; and

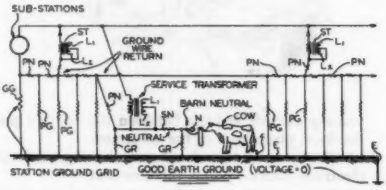
at least one secondary circuit breaker and one secondary contactor directly connecting a secondary bar to the battery.

4,551,633

ELECTRONIC GROUNDING SYSTEM FOR ELECTRICAL DISTRIBUTION SYSTEMS

David F. Winter, Kirkwood, and William K. Dick, St. Louis, both of Mo., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 24, 1983, Ser. No. 508,060
Int. Cl.[4] H04B *3/28;* A01J *3/00*
U.S. Cl. 307—147 **13 Claims**



1. A voltage compensating system for reducing the magnitude of stray voltage, with respect to true earth ground potential, on the grounded neutral conductor of an electrical distribution system, said system comprising:

means for providing a point of reference potential with respect to said ground potential;

amplifying means having a first input connected to said means and a second input for connection to said grounded neutral conductor for providing an output signal indicative of the difference between said stray voltage and said reference potential, said amplifying means having an output terminal adapted for connection to an external circuit and having output means for coupling said output signal between said second input and said output termnal; and,

means connecting between said output terminal and said true earth ground for providing an auxiliary ground path therebetween.

4,551,634

MULTIPLEXING INPUT CIRCUIT

Hitoshi Takahashi, Yokohama; Satoru Yamaguchi, and Hideo Nunokawa, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,581
Claims priority, application Japan, Mar. 31, 1982, 57-051143
Int. Cl.[4] H03K *17/60;* H04J *3/02*
U.S. Cl. 307—243 **6 Claims**

1. An input circuit for receiving an input signal and transferring the input signal to an internal circuit, the input circuit having a plurality of channels, one of the channels being selectively activated while the remaining channels are nonselected, each of the channels comprising:

an input terminal for receiving the input signal;

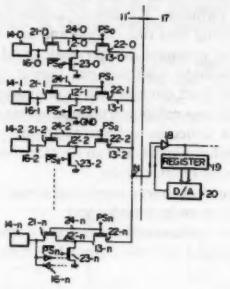
an output terminal operatively connected to the internal circuit;

a first transistor having a current carrying path having a first end which is connected to said first input terminal, and having a second end;

a second transistor having a current carrying path having a first end connected to the second end of said current carrying path of said first transistor, and having a second end connected to said output terminal; and

a third transistor having a current carrying path having a first end connected to a connection point between the

second end of said current carrying path of said first transistor and the first end of said current carrying path of



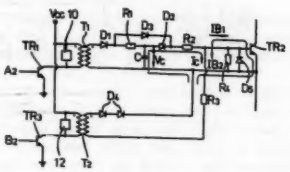
said second transistor, and having a second end connected to a predetermined constant voltage level.

4,551,635

CIRCUIT FOR DRIVING THE BASE OF A TRANSISTOR

Kazuo Kuroki, Tokyo, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Sep. 13, 1982, Ser. No. 417,205
Int. Cl.⁴ H03K *17/60, 3/26*
U.S. Cl. 307—254 **5 Claims**



1. A circuit for driving the base of a transistor by supplying a signal from a control circuit to the base in an insulating manner comprising:

a first pulse transformer having a primary winding and a secondary winding, the first transformer being responsive to a pulse string signal corresponding to an ON signal from the control circuit applied to its primary winding for alternatingly being energized and de-energized;

first circuit means coupled to the secondary winding for rapidly supplying a base drive current to the transistor while the first pulse transformer is energized;

second circuit means, including capacitor means and means for charging the capacitor means while the first pulse transformer is energized, coupled to first circuit means and supplying base current drive to the transistor when the capacitor means is charged and the first pulse transformer is de-energized; and

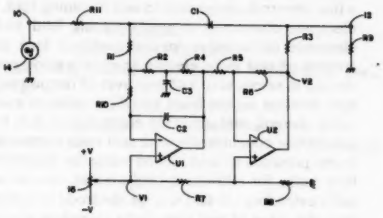
third circuit means including a second pulse transformer having a primary winding and a secondary winding, the second transformer being responsive to a pulse signal corresponding to an OFF signal from the control circuit applied to its primary winding for being energized, the secondary winding of the second transformer being coupled to the second circuit through one or more diodes for discharging the capacitor means and terminating the base current drive to the transistor when the second transformer is energized.

4,551,636

WIDE BANDWIDTH SIGNAL COUPLING CIRCUIT HAVING A VARIABLE VOLTAGE-LEVEL SHIFT FROM INPUT TO OUTPUT

Roland E. Andrews, Portland, and John L. Addis, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 25, 1983, Ser. No. 497,917
Int. Cl.⁴ H03K *5/00*
U.S. Cl. 307—264 **3 Claims**



1. A signal coupling circuit, comprising:

an input terminal and an output terminal;

a high-frequency signal transmission path comprising a capacitor coupled between said input terminal and said output terminal;

a low frequency signal transmission path comprising an operational amplifier and a differential amplifier connected in series between said input terminal and said output terminal; and

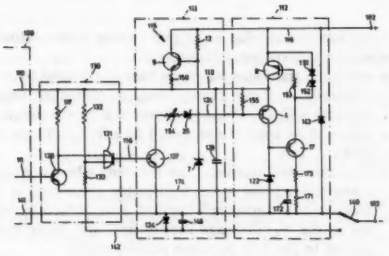
a variable DC voltage source coupled to said operational amplifier.

4,551,637

ELECTRONIC MONITORING SYSTEM WITH DIRECT-CURRENT POWER SUPPLY

Robert Buck, Neukirch, and Jean L. Lamarche, Langenargen, both of Fed. Rep. of Germany, assignors to IFM Electronic GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,122
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214835; Oct. 16, 1982, 3238396
Int. Cl.⁴ H03K *3/26*
U.S. Cl. 307—308 **17 Claims**



1. An electronic monitoring system comprising;

detector means sensitive to an ambient condition for generating on an output lead a binary signal alternating between a first and second value in response to significant changes in said ambient condition, said detector means being provided with a pair of power-input terminals;

a voltage-generating network provided with an incoming lead, an outgoing lead and a common lead, said outgoing and common leads being respectively connected to said power-input terminals;

a utilization circuit including a source of direct current in series with a load, said utilization circuit having a supply terminal of one polarity connected to said incoming lead and a supply terminal of the opposite polarity connected to said common lead; and

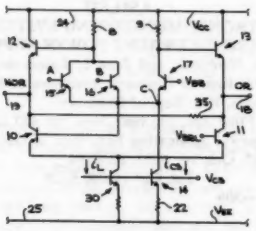
a binary switching circuit connected across said incoming and common leads, said switching circuit including a main electronic switch and an ancillary electronic switch, said main electronic switch having a control electrode coupled to said output lead, said ancillary electronic switch having a first electrode connected to said incoming lead, a second electrode connected to said outgoing lead and a third electrode connectable to said common lead under the control of said main electronic switch upon conduction thereof in response to a changeover of the output signal of said detector means from said first value to said second value thereof, said ancillary electronic switch becoming conductive concurrently with said main electronic switch in the presence of said second value for establishing two flow paths for additional load current, one of said flow paths extending via said second electrode to said outgoing lead, the other of said flow paths extending via said third electrode to said common lead, said voltage-generating network including current-limiting impedance means lying in parallel with said one of said flow paths between said incoming and outgoing leads.

4,551,638

ECL GATE WITH SWITCHED LOAD CURRENT SOURCE

Hemmige D. Varadarajan, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 19, 1983, Ser. No. 562,802
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—455 **10 Claims**



1. An emitter coupled logic gate having a true output and a complementary output, comprising:

a reference transistor having a base connected to a switch reference voltage supply line, a collector connected through a first collector resistor to a V_{CC} voltage supply line, and an emitter connected to a first common emitter node;

at least one input transistor, each having a base connected to a respective input node, a collector connected at a common collector node and through a second collector resistor to the V_{CC} voltage supply line, and an emitter connected to the first common emitter node;

a first emitter follower transistor having a base connected to the collector of said reference transistor, a collector connected to the V_{CC} voltage supply line, and an emitter connected to an output line supplying one output of the true or complementary outputs;

a second emitter follower transistor having a base connected to the common collector node of said at least one input transistor, a collector connected to the V_{CC} voltage supply line, and an emitter connected to an output line supplying the other output of the true or complementary outputs;

a main current source supplying a gate current at the first common emitter node;

a first load current source transistor having a base connected to a circuit node which experiences a voltage swing as the gate switches, a collector connected to the output line supplying said one output and an emitter connected to a second common emitter node, said voltage swing being out-of-shape with said one output as the gate switches;

a second load current source transistor having a base connected to a reference node suppling a load reference voltage, a collector connected to the output line supplying said other output, and an emitter connected to said second common emitter node;

a load current source supplying a load current at said second common emitter node; and

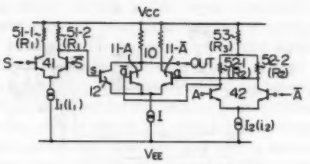
a resistor connected between the output line supplying said one output and the output line supplying said other output.

4,551,639

EMITTER COUPLED LOGIC CIRCUIT CONTROLLED BY A SET INPUT SIGNAL

Hirofumi Takeda, Yokohama, and Hirokazu Suzuki, Yamato, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 9, 1983, Ser. No. 502,560
Claims priority, application Japan, Jun. 29, 1982, 57-110619
Int. Cl.[4] H03K *19/086, 19/092, 3/023, 19/003*
U.S. Cl. 307—455 **13 Claims**



1. An emitter coupled logic circut, operatively connected to receive complementary logic input signals having high and low potentials, respectively, and a set input signal having a high potential side and a low potential side and being operatively connectable to first and second power supplies, said emitter coupled logic circuit having an output terminal and comprising:

a differential transistor pair, operatively connected between the first and second power supplies, one transistor of said differential transistor pair having a collector operatively connected to the output terminal for providing an output from the differential transistor pair, the transistors in said differential transistor pair having bases operatively connected to receive the complementary logic input signals as control input signals, respectively, said differential transistor pair having emitters coupled to each other; and

a set transistor having a base operatively connected to receive the set input signal as a control input signal, said set transistor being connected in parallel with said differential transistor pair,

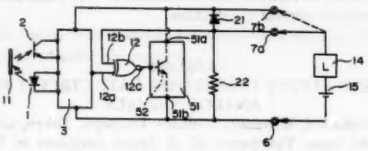
a logic level of the high potential side of the set signal being higher than a logic level of the high potential of the complementary logic input signals by a first predetermined level difference, and

a logic level of the low potential side of the set input signal being lower than a logic level of the low potential of the complementary logic input signals by a second predetermined level difference.

4,551,640
DUAL ELECTRONIC SWITCHING DEVICE WITH REDUCED EXTERNAL TERMINALS

Toshifumi Fukuyama, Kyoto, and Kiyohide Okamoto, Otsu, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 597,561, Apr. 6, 1984, abandoned, which is a continuation of Ser. No. 274,074, Jun. 16, 1981, abandoned. This application Nov. 19, 1984, Ser. No. 672,171
Claims priority, application Japan, Jun. 16, 1980, 55-81103
Int. Cl.⁴ H03K *19/21, 17/60*
U.S. Cl. 307—471 **12 Claims**



1. An electronic switching device energizable by connection to an external power source, said device being selectively operable in one of a normally open mode and a normally closed mode of operation depending on the connection to said external power source, comprising:

a plurality of external terminals for connection to said external power source and to an external load, said terminals including a first set of selectable terminals for selective connection to an external power source and a load, and a second set of selectable terminals for selective connection to an external power source and a load;

output circuit means for completing an electrical connection between said first or second set of selectable terminals, said output means having an open circuit state and a short circuit state;

logic circuit means connected to said output circuit means for forcing said output circuit means into said short circuit state or said open circuit state, said logic circuit means having two inputs and being responsive to signals received on said two inputs for forcing said output circuit means into one of said short circuit and open circuit states;

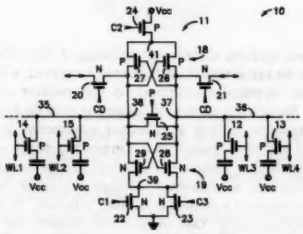
detection circuit means for generating a detection signal and supplying said detection signal to one of said inputs of said logic circuit to cause said logic circuit means to force said output circuit means to change from one of said open circuit and short circuit states to the other of said open circuit and short circuit states; and

connection means disposed between said external terminals and said logic circuit means for feeding a signal to the other terminal of said logic circuit means to cause said logic circuit means to force said output circuit means normally into said open circuit state or said short circuit state in dependence on the set of selectable terminals chosen for connection to an external power source and a load, said connection means comprising a first polarity lead, means for connecting said first polarity lead to said first set of selectable terminals and said second set of selectable terminals to receive a first polarity voltage from an external power supply through either set of terminals, a second lead connected to said other input of said logic circuit means and to said output circuit, a resistor for connecting said second lead to said first polarity lead, means for connecting said second lead to said first set of selectable terminals for receiving a second polarity voltage when an external power supply is connected to said first set of selectable terminals and for passing current between said output circuit and said first set of selectable terminals; a third lead connected to said output circuit, and means for passing current between said third lead and said second set of selectable terminals, whereby an external power source may be connected to said first set of selectable terminals in series with a load to cause said output means to operate in one of the normally open and normally short circuit states, or can be connected to said second set of selectable terminals in series with a load to cause said output circuit to operate in the other of said normally open and normally short circuit states.

4,551,641
SENSE AMPLIFIER

Perry H. Pelley, III, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 23, 1983, Ser. No. 554,517
Int. Cl.⁴ H03K *5/24;* **G11C** *7/06*
U.S. Cl. 307—530 **3 Claims**



1. A sense amplifier coupled to a pair of bit lines for sensing and amplifying a voltage differential between the pair of bit lines, comprising:

a first n channel transistor having a first current electrode coupled to a first bit line of the pair of bit lines, a control electrode coupled to a second bit line of the pair of bit lines, and a second current electrode;

a second n channel transistor having a first current electrode coupled to the second bit line, a control electrode coupled to the first bit line, and a second current electrode coupled to the second current electrode of the first transistor;

a third n channel transistor having a first current electrode coupled to the second current electrodes of the first and second n channel transistors, a control electrode for receiving a first signal, and a second current electrode coupled to a first power supply terminal;

a first p channel transistor having a first current electrode coupled to the first bit line, a control electrode coupled to the second bit line, and a second current electrode;

a second p channel transistor having a first current electrode coupled to the second bit line, a control electrode coupled to the first bit line, and a second current electrode coupled to the second current electrode of the first p channel transistor;

a third p channel transistor having a first current electrode coupled to the second current electrodes of the first and second p channel transistors, a control electrode for receiving a second signal, and a second current electrode coupled to a second power supply terminal; and

a fourth n channel transistor having a first current electrode coupled to the second current electrodes of the first and second n channel transistors, a control electrode for receiving a third signal, and a second current electrode coupled to the first power supply terminal;

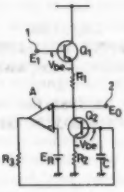
wherein the second signal switches to a logic low a predetermined time duration after the first signal switches to a logic high, and the third signal switches to a logic high a predetermined time duration after the second signal switches to a logic low.

4,551,642

LEVEL SHIFTING CIRCUIT

Koki Aizawa, and Akira Haeno, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Japan

Filed Mar. 4, 1983, Ser. No. 472,331
Claims priority, application Japan, Mar. 5, 1982, 57-30449[U]
Int. Cl.⁴ H03K *5/08*; H03G *3/20*
U.S. Cl. 307—552 **6 Claims**



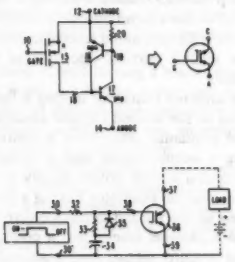
1. A level-shifting circuit, comprising; a first transistor for converting an input signal voltage into a current; a first resistor having one terminal connected to the emitter of said first transistor, for setting a current value for said first transistor; a second transistor having a collector connected to the other terminal of said first resistor at a connecting point, said second transistor including means as a current source and for supplying said current; a high-gain voltage amplifier having two input terminals and a output terminal, wherein, an input voltage at said connecting point of said first resistor and the collector of said second transistor is applied to one of said input terminals and a reference potential applied at another of said input terminals; and said output terminal of said high-gain voltage amplifier is coupled to the base of said second transistor through a low pass filter, said low-pass filter comprising a signal path between the output of said high-gain voltage amplifier and said base of said second transistor, and a capacitor coupled between said base of said second transistor and ground, said capacitor for grounding said base of said second transistor wherein the level shift is automatically varied with the input variation so that level shifted output is maintained at a constant potential approximately equal to said reference potential.

4,551,643

POWER SWITCHING CIRCUITRY

John P. Russell, Pennington, and Alvin M. Goodman, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1983, Ser. No. 545,047
Int. Cl.⁴ H03K *17/284, 17/30, 17/72*
U.S. Cl. 307—570 **4 Claims**



1. In combination:

a four-layered insulated-gate-controlled semiconductor device having gate, cathode and anode terminals, having a conduction path between said cathode and anode terminals and said device being characterized in that the level of its anode-to-cathode current is responsive to and monotonically controlled by, the gate-to-cathode potential for anode-to-cathode currents extending up to a given level; said device being nevertheless susceptible to latch-up for anode-to-cathode current below said given level when the rate of change of a turn-off potential applied to the gate is greater than a given value;

means for applying control potentials between said gate and cathode terminals; and

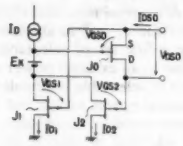
means coupled to said gate terminal for extending the anode-to-cathode current range, in which said device does not latch-up including means for limiting the rate of change of said gate-cathode control potentials having a polarity tending to turn-off said device, and to extinguish anode-to-cathode current conduction.

4,551,644

FIELD EFFECT TRANSISTOR GATE CIRCUIT FOR ANALOG SIGNALS

Eiji Nishimori, Kawasaki; Chikara Tsuchiya, Tokyo, and Yoshiaki Sano, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 31, 1983, Ser. No. 547,236
Claims priority, application Japan, Nov. 2, 1982, 57-192952
Int. Cl.⁴ H03K *17/16, 17/693*
U.S. Cl. 307—573 **7 Claims**



1. A field effect transistor gate circuit for analog signals comprising:

a first field effect transistor (FET) for switching ON and OFF an input signal;

a control voltage source for applying a control voltage for varying the gate voltage of said first FET and for controlling the conductance of said first FET;

a second FET for detecting the source voltage of said first FET and for keeping a variation of voltage between the gate and source of said first FET small when said first FET is in a conductive state;

a third FET for detecting the drain voltage of said first FET and for keeping a variation of voltage between the gate and drain of said first FET small when said first FET is in a conductive state; and

a constant current source for supplying a constant current to said second and third FETs.

4,551,645

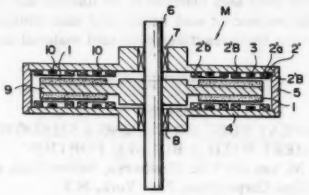
DISC TYPE BRUSHLESS MOTOR

Yoshiteru Takahashi, Yamakita, and Masataka Ogawa, Atsugi, both of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 3, 1982, Ser. No. 384,598
Int. Cl.⁴ H02K *37/00*
U.S. Cl. 310—46 **19 Claims**

1. A disc type brushless motor comprising a rotor means provided with a 2 m-pole field magnet consisting of north and south poles alternately positioned, wherein m designates a positive integer of 1 or larger, and a stator means provided with loop-like armature power windings in which the angle between the radial conductor sections of each armature power winding is approximately equal to the pole width of said field magnet, said armature power windings being flatly positioned opposite to said field magnet in quantity of two or more in the

circumferential direction of said stator means and in two stages or more in the radial direction thereof, said stator means being



also provided with position detecting elements for detecting said poles of said field magnet.

4,551,646

DOUBLE COIL CONSTANT FORCE EXTENSION SPRING BRACKET

Gerald W. Brown, Christiansburg, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Aug. 24, 1982, Ser. No. 411,076
Int. Cl.⁴ H02K *13/00*
U.S. Cl. 310—242 **9 Claims**

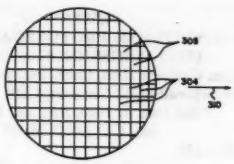
1. An improved brush holder assembly of the type having a brush connected to a shunt cap through a shunt and straddled by a constant force spring having two extendable coils, wherein the improvement comprises a spring bracket straddling the spring and a shunt cap and slidably engaging the coils of the spring so that the coils may be extended, a holder open on both ends into which said spring bracket is removably inserted so that the brush partially protrudes from one end of said holder, and a cap for closing the other end of said holder removably attached thereto, said spring bracket being comprised of a pair of arms slidably engaging the coils of the spring, the shunt cap having slots therein so that said spring bracket can straddle said shunt cap and yet hug said spring, and thereby the brush.

4,551,647

TEMPERATURE COMPENSATED PIEZOELECTRIC TRANSDUCER AND LENS ASSEMBLY AND METHOD OF MAKING THE ASSEMBLY

Robert A. Day, Livermore, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Mar. 8, 1983, Ser. No. 472,871
Int. Cl.⁴ H01L *41/08*; H04R *17/00*
U.S. Cl. 310—335 **33 Claims**



1. An ultrasonic transducer comprising:

a piezoelectric crystal including first and second opposite crystal surfaces, the structure of said crystal being weakened in at least one of said surfaces in accordance with a predetermined line pattern;

at least one lens having a first lens surface conforming to said first crystal surface and being bonded thereto;

said conforming surfaces of said lens and said crystal having dissimilar coefficients of expansion in at least a first direction along said conforming surfaces;

said pattern having a predetermined orientation relative to said first direction; and

means for providing electrical connections to said first and second crystal surfaces respectively;

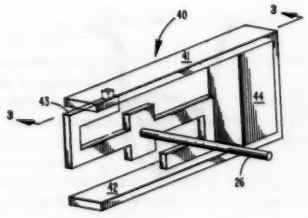
whereby said weakened crystal structure is adapted to relieve stress in said crystal caused by unequal expansion or contraction between said crystal and said lens in said first direction.

4,551,648

LINE CATHODE HEATER AND SUPPORT STRUCTURE FOR A FLAT PANEL DISPLAY DEVICE

Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1983, Ser. No. 537,816
Int. Cl.⁴ H01J *1/88*
U.S. Cl. 313—37 **3 Claims**



1. A heater and support structure for a line cathode comprising:

a pair of spaced heater electrodes, said heater electrodes having a resistance higher than the resistance of said cathode whereby current passing through said heater electrodes and said cathode causes heat generated in said

heater electrodes to compensate for heat loss from said cathode;

a cathode support member for supporting said cathode between said heater electrodes, said support member being configured as a substantially S-shaped member to compensate for thermal expansion whereby the positioning of said cathode remains substantially constant during temperature changes, said support member having a cathode retention portion in the proximity of the center and having coupling portions in the proximity of the open ends for coupling said support member to said heater electrodes.

4,551,649

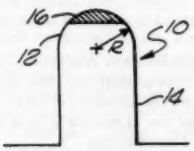
ROUNDED-END PROTUBERANCES FOR FIELD-EMISSION CATHODES

Roy E. Olson, Granada Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 8, 1983, Ser. No. 559,543

Int. Cl.⁴ A47B *88/00*

U.S. Cl. 313—336 **7 Claims**



1. A field-emission device cathode comprising:

a cathode base member; and

a plurality of spaced protuberances extending from said base member, the tip of each said protuberance being a spherical zone, each spherical zone having a radius R which is approximately equal to $1/\beta$ where β is the field enhancement factor, said R being a value so that the operating point of the tip lies on a point on the curve of the log of emitter current density vs $(10^8/\beta V)$ well below the point at which impedance collapse occurs.

4,551,650

FIELD-EMISSION ION SOURCE WITH SPIRAL SHAPED FILAMENT HEATER

Tamotsu Noda, Toyohashi; Hifumi Tamura, Hachioji, and Hiroshi Okano, Ohta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,642

Claims priority, application Japan, Nov. 24, 1981, 56-173288[U]

Int. Cl.⁴ H01J *33/02, 49/10*

U.S. Cl. 313—362.1 **7 Claims**

1. A field-emission-type ion source comprising a needle-pointed emitter tip, a heater for heating said emitter tip and a material to be ionized, said heater being made from a spiral-shaped filament heater which is welded to said emitter tip, a reservoir set at the intersection of said emitter tip and said heater to store said material to be ionized, an extracting electrode situated at the front end of said emitter tip to extract ions of said material to be ionized from the end of said emitter tip which is wet by said melted material to be ionized, and a coating-layer which is made from a refractory substance which is anti-reactive with said material to be ionized and which is coated on the surface of said heater and said emitter tip, in order to prevent their reactions with said material to be ionized.

4,551,651

COLOR DISPLAY TUBE INCLUDING A SHADOW MASK SHEET WITH A BULGED PORTION

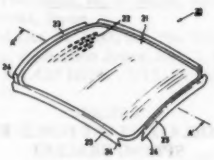
Robert F. L. M. van der Ven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

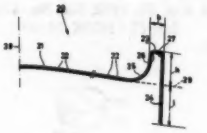
Continuation of Ser. No. 536,227, Sep. 27, 1983, abandoned, which is a continuation of Ser. No. 270,446, Jun. 4, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,745

Claims priority, application Netherlands, Jun. 23, 1980, 8003608

Int. Cl.⁴ H01J *29/02, 29/07*

U.S. Cl. 313—402 **9 Claims**





1. A color display tube comprising an envelope including a rectangular display window, a rectangular shadow mask sheet including an apertured portion, mounting means for attaching the sheet to the display window, and an electron gun system for directing a plurality of electron beams through the apertures to the display window, said mounting means comprising:

(a) peripheral sides of the shadow mask sheet, each side shaped such that it includes a bulged portion extending toward the display window and a terminating collar extending away from the display window, and such that the center of mass of each side, when viewed in a cross-section taken perpendicular to a longitudinal axis of the side, lies in a plane which is an extension of the apertured portion of the shadow mask sheet; and

(b) attachment members attached to the collars substantially along said planes.

4,551,652

DISPLAY SCREEN HAVING ALUMINUM PHOSPHATE BARRIER LAYER AND METHOD OF MANUFACTURE

Johannes M. A. A. Compen, and Cornelis Maan, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,844

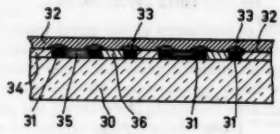
Claims priority, application Netherlands, Jun. 3, 1981, 8102689

Int. Cl.⁴ H01J *29/28, 29/10;* B05D *5/06*

U.S. Cl. 313—466 **7 Claims**

1. In a display tube comprising an envelope including a display window, a display screen disposed on an inner surface of said display window, and means for directing an electron beam at said screen, said display screen comprising at least one

layer of a luminescent material deposited on said display window, at least one layer of a particulate carbon-containing material, and an electron permeable layer of an aluminum containing material deposited on said luminescent material,



the improvement comprising a layer of aluminum phosphate disposed between said carbon-containing material and said aluminum containing material.

4,551,653

PRODUCTION OF CORRECTION SIGNALS IN A COLOR CRT SYSTEM

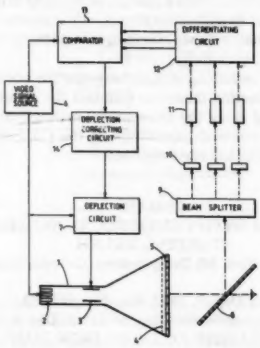
Cyril Hilsum, Middlesex, England, assignor to The General Electric Company, p.l.c., United Kingdom

Filed May 24, 1984, Ser. No. 613,967

Claims priority, application United Kingdom, Jun. 2, 1983, 8315183

Int. Cl.[4] H01J *31/26*

U.S. Cl. 315—10 **9 Claims**



1. A system including a color cathode ray tube (CRT) having electron gun means producing at least one electron beam; a display screen having at least two different color phosphors; means for applying color input signals to the electron gun means; one input signal for each different color phosphor; means for deflecting the electron beam across the screen; and means for utilizing correction signals to control the deflection of the electron beam so as to reduce deviations of color output signals from the CRT from color input signals to the CRT, wherein the improvement comprises having said deflection means including means for producing signals representing the respective light outputs from the different color phosphors substantially at the moment of impact of the electron beam in operation and means for comparing each said light output signal with said color input signals to the CRT to thereby provide correction signals indicative of deviations of said output signals from the corresponding input signals which said correction signals are utilized as aforesaid for controlling the deflection of the electron beam.

4,551,654

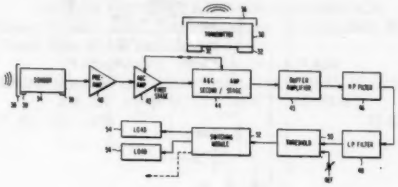
LIGHTING CONTROL SYSTEM AND METHOD

Charly Barnum, Saddle River, N.J., assignor to Kesser Electronics International, Inc., Totowa, N.J.

Continuation of Ser. No. 270,850, Jun. 5, 1981, abandoned. This application May 31, 1984, Ser. No. 615,545

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—159 **8 Claims**



1. A lighting system for a space comprising:

(a) a source of illumination for the space;

(b) a control circuit for said source of illumination;

(c) means for radiating electromagnetic energy at a predetermined ultrasonic frequency and at a generally constant amplitude into the space to be monitored;

(d) means for detecting electromagnetic energy reflected from the objects in the space, said energy being in the form of the radiated ultrasonic energy modulated by a signal representing any motion within the space, said means providing a first signal;

(e) means for automatically adjusting the amplitude of said first signal to within predetermined limits;

(f) means for filtering out the frequency components of the amplitude adjusted first signal other than the predetermined frequency; and

(g) means for detecting variations in the amplitude of said first signal in excess of said predetermined limit to generate a control signal in response thereto to energize and deenergize said illumination control circuit.

4,551,655

TELEVISION LINE DEFLECTION CIRCUIT

Franciscus W. A. Timmermans, Breda, Netherlands, and Frederik J. Van Roessel, Upper Saddle River, N.J., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,125

Claims priority, application Netherlands, Nov. 2, 1981, 8104947

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—370 **9 Claims**

1. A television line deflection circuit for deflecting an electron beam comprising:

a main deflection signal generator for supplying a line periodic pulse shaped voltage to a deflection coil;

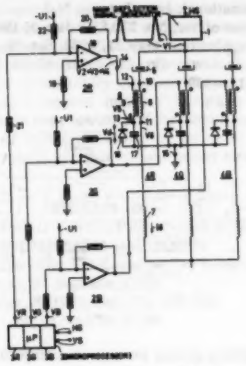
a transformer having a first and a second winding;

a deflection coil;

said main deflection signal generator, transformer first winding, and deflection coil connected to form a series circuit; and

an auxiliary deflection signal generator means for producing an auxiliary deflection current, having an amplifier circuit connected to a first end of said second winding to supply a line deflection correcting signal, and a second end of said second winding connected through a diode to a common terminal of said auxiliary deflection signal generator;

whereby said auxiliary deflection circuit in response to an input signal which changes level in steps, supplies a step-



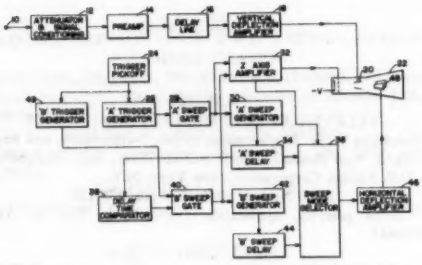
wise change in current in said deflection coil, correcting the linearity of line deflection of said electron beam.

4,551,656

OSCILLOSCOPE HAVING DUAL TIME BASE SYSTEM FOR ACCURATE DIFFERENTIAL TIME MEASUREMENT

Arthur J. Metz, Gervais, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 1, 1982, Ser. No. 437,971
Int. Cl.⁴ G01R *13/28*
U.S. Cl. 315—392 **15 Claims**



1. A time base system for an oscilloscope, comprising a first sweep generator for generating a first sweep ramp voltage;

means coupled to the output of said first sweep generator for shifting said first sweep ramp voltage in such a manner that a level comparison may be made on said first sweep ramp voltage after at least a predetermined time duration so as to effect a predetermined first delay thereof;

means for providing a second delay of said first sweep ramp voltage;

a second sweep generator responsive to said level comparison of said first delayed first sweep ramp voltage for generating a second sweep ramp voltage; and

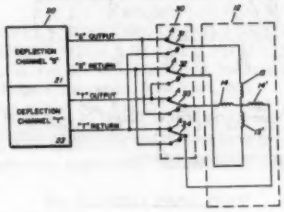
means for selectively applying said second delayed first sweep ramp voltage and said second sweep ramp voltage to the horizontal deflection system of said oscilloscope.

4,551,657

FORMAT RECONFIGURABLE CRT DISPLAY

Gary Miller, Binghamton; Sam S. Jobes, Vestal, and David P. Benfey, Endwell, all of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,215
Int. Cl.⁴ H01J *29/70, 29/76*
U.S. Cl. 315—399 **3 Claims**



1. In an electronic display including a CRT having at least one electron beam and beam deflection means including horizontal and vertical deflection means for deflecting said electron beam in orthogonal directions;

(a) means for generating horizontal and vertical deflection signals, the slew rates of said horizontal signal being greater than that of said vertical deflection signal;

(b) means for coupling the horizontal signal to the horizontal deflection means and the vertical signal to the vertical deflection means;

(c) means for maintaining the display format in the same spatial orientation with a change in physical orientation of the CRT and its deflection means, or to reorient the spatial display format without changing the physical orientation of the CRT, including;

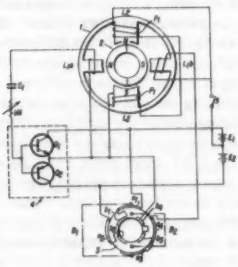
(d) means for switching signals between the horizontal and vertical deflection means to maintain the different sweep rates aligned along the same spatial orthogonal axes even though the physical orientation of the CRT and the deflection means has been changed.

4,551,658

D.C. MOTOR WITH CENTRIFUGAL SEPARATION STARTING BRUSH

Byung Y. Rhee, 103-5, 4th Dongsandong, Gurogu, Seoul, Rep. of Korea

Filed Dec. 7, 1982, Ser. No. 447,632
Claims priority, application Rep. of Korea, Dec. 8, 1981, 4777
Int. Cl.⁴ H02P *1/22, 6/02;* **H02K** *23/24*
U.S. Cl. 318—254 **5 Claims**



1. A D.C. motor comprising:

a rotor made of a permanent magnet:

a stator having two driving coils, a starting coil and an induction sensing coil;

said driving coils being arranged on diametrically opposite sides of the stator;

said starting coil being arranged at 90 degrees from each of said driving coils;

said induction sensing coil being arranged at 90 degrees from each of said driving coils and 180 degrees from said starting coil;

a commutator being fixedly connected to said stator;

a brush mounted on said rotor and moving in synchronism therewith, said brush being pivotally mounted so as to be in contact with said commutator when moving at slow speeds, but pivoting out of contact with said commutator when moving at higher speeds; and

wherein said induction sensing coil is connected to a capacitor which received charging the discharging current from said induction coil caused by the rotation of the magnetic field of said rotor through said coil.

4,551,659

TRACKSIDE-CONTROLLED ELECTRIC RAILWAY SYSTEMS

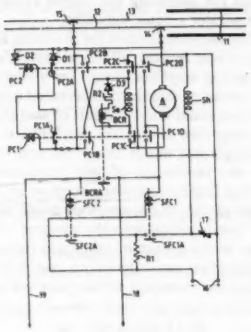
John D. Markham, 58 Dunkirk St., Droylsden, Manchester, England (M35 7DZ)

Filed Oct. 11, 1983, Ser. No. 540,488

Claims priority, application United Kingdom, Oct. 11, 1982, 8228981

Int. Cl.[4] H02P *3/00*

U.S. Cl. 318—258 **11 Claims**



1. A trackside-controlled electric locomotive incorporating the combination of:

first and second current pick-up means for movable engagement with first and second stationary power-supply conductors,

a d.c. electric traction motor comprising an armature, a series field winding and a shunt winding, the armature having a first current supply connection connected to the first said pick-up means and a second current supply connection, a shunt-winding exciting circuit, including an on-board d.c. power supply,

first switch means responsive to the occurrence of a warning signal applied to the stationary power-supply conductors and indicative of the polarity of a d.c. power supply to be applied to such conductors and thereby to the said pick-up means, said first switch means being arranged, in response to said warning signal, to connect the series winding between the second said pick-up means and the said second current supply connection of the armature, and responsive to the indicated polarity sense for the d.c. power to be applied to make such connection in the corresponding sense such that magnetic flux produced by the series winding due to current flowing therein in the direction corresponding to such voltage polarity is additive to magnetic flux produced by the shunt winding when excited by the onboard d.c. power supply, and

a polarity-sensitive bypass circuit connected in parallel across the series winding and providing a low-impedance series-winding bypass for current flow in the direction against said voltage polarity.

4,551,660

MOTOR CONTROLLING SWITCH DEVICE

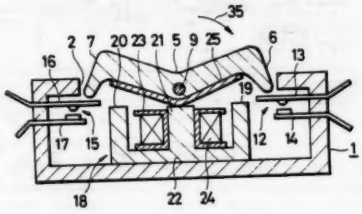
Masaru Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Jul. 3, 1984, Ser. No. 627,638

Claims priority, application Japan, Jul. 4, 1983, 58-121466

Int. Cl.[4] H02P *1/22;* **H01H** *71/18, 83/22*

U.S. Cl. 318—293 **11 Claims**



1. A motor controlling switch comprising:

a. a casing;

b. an operating member provided in said casing wherein said operating member is movable between a primary position and an operating position;

c. a switch located in said casing wherein when said operating member is in an operating position said switch is in the on position;

d. an electromagnetic device located in said casing, said electromagnetic device being connected to said switch, wherein said electromagnetic device holds said operating member in an operating position after said operating member has been moved to an operating position;

e. a restoring member located between said casing and said operating member wherein said restoring member is deformed when said operating member is in an operating position, and said restoring member is a material which restores said restoring member to a normal shape when heated with an electric current.

2. A motor controlling switch, comprising:

a. a casing;

b. first and second pair of electrical switch contacts in said casing;

c. a knob pivotally mounted in said casing for operating said first and second pair of electrical switch contacts;

d. first and second means for biasing said knob in a primary position, said first and second biasing means being coupled in series electrically to said first and second pair of electrical switch contacts, respectively;

e. a magnetically attractive piece mounted under said knob; and

f. means located under said knob for generating a magnetic field for holding said knob in a depressed position.

4,551,661

DRIVING APPARATUS FOR A RECORDING MEDIUM

Shigeaki Wachi, Higashikurume, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,977

Claims priority, application Japan, Oct. 14, 1982, 57-180222

Int. Cl.[4] G05B *5/00*

U.S. Cl. 318—314 **5 Claims**

1. Driving apparatus for use with a record medium having a signal recorded thereon, said signal including a periodic syn-

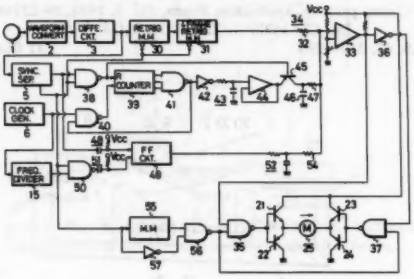
chronizing signal of a first frequency, said apparatus comprising:

motor means for driving said record medium;

sync signal reproducing means for reproducing said synchronizing signal;

clock means for generating clock pulses having a second frequency substantially higher than said first frequency;

counter means for counting said clock pulses from said clock means to a preset value n, n being less than said second frequency divided by said first frequency, said counter means producing a digital output signal and being reset by said synchronizing signal;



circuit means coupled to said counter means for producing an analog output signal which corresponds to a time interval from the time when said counter means reaches said preset value n to the time said counter means is reset, said circuit means comprising inverter and integrator means responsive to said digital output signal from said counter means to produce an integrated signal and sample-and-hold means for sampling and holding said integrated signal; and

comparator means for comparing said analog output signal with a reference signal to produce a control signal for controlling said motor means to drive said record medium at a constant linear speed relative to a pickup device.

4,551,662

MOTOR SPEED DETECTING DEVICE

Hiroshi Ishida, Tokyo, and Mitsuyuki Taniguchi, Hino, both of Japan, assignors to Fanuc Ltd, Yamanashi, Japan

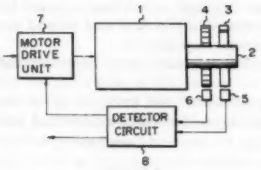
PCT No. PCT/JP84/00358, § 371 Date Mar. 6, 1985, § 102(e) Date Mar. 6, 1985, PCT Pub. No. WO85/00430, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 11, 1984, Ser. No. 711,535

Claims priority, application Japan, Jul. 11, 1983, 58-124822

Int. Cl.⁴ H02P *5/00*; **G05B** *5/00*

U.S. Cl. 318—316 **1 Claim**



1. A motor speed detecting device comprising:

a first slotted disc composed of ferromagnetic material, having one slot and being mounted on the rotational shaft of a motor driven by a motor drive unit;

a second slotted disc composed of ferromagnetic material, having a plurality of slots;

a first magnetic sensor mounted in close proximity to said first slotted disc, for outputting a first pair signals having a phase difference in response to the width of said slot by one half;

a second magnetic sensor mounted in close proximity to said second slotted disc, for outputting a second pair of signals having a phase difference in response to the width of said slot by one half, and also for outputting a third pair of signals inverted with respect to said second pair of signals; and

a detector circuit for receiving the outputs of said first and second magnetic sensors and for detecting said outputs;

said detector circuit comprising:

a first differential amplifier circuit for counting the difference between said first pair of signals from said first magnetic sensor;

a first comparator circuit for comparing the output from said first differential amplifier circuit with a reference voltage;

a second differential amplifier circuit and a third differential amplifier circuit for receiving respectively said second and third pairs of signals having an opposite phase relationship to each other from said second magnetic sensor and counting the difference therebetween;

a vector synthetic comparator circuit for receiving the outputs of said second and third differential amplifier circuits and searching for the signals having each phase angle of 0, 22.5, 45, 67.5, 90, 112.5, 135 and 157.5 degrees at a phase difference of 22.5 degrees respectively, when the phase angle of the output waveform of the magnetic sensor in response to the width of said slot is 180 degrees, then comparing said signals with the reference voltage to make a series of eight rectangular waves;

a logic circuit for operating the output of said vector synthetic comparator circuit logically;

a first inverting amplifier circuit for inverting and amplifying the output of said second differential amplifier circuit; and

a second inverting amplifier circuit for inverting and amplifying the output of said third differential amplifier circuit;

wherein the sinusoidal wave outputs of said first and second inverting amplifier circuit are rendered to control said motor through said motor drive unit and to provide one pulse per one revolution of said rotational shaft to the output of said first comparator circuit, to provide a rectangular wave of the frequency four times as large as the frequency corresponding to the number of slots of said second disc to the output of said logic circuit and to provide a rectangular wave having a one quarter period of phase difference from said rectangular wave.

4,551,663

LEVEL CONTROL DEVICE

George E. Gruber, Port Sanilac, Mich., assignor to Ludlow Industries, Inc., Elburn, Ill.

Filed Aug. 1, 1984, Ser. No. 636,545

Int. Cl.⁴ H01H *35/00*

U.S. Cl. 318—482 **20 Claims**

1. A level control device, comprising

a housing,

shaft means rotatable in said housing and having a projecting portion extending from said housing,

paddle means on said projecting portion for engagement by rising material whose level is to be controlled,

the rotation of said paddle means being impeded by the drag caused by the rising material,

a carrier in said housing and mounted on said shaft means for rotation therewith,

a plurality of levers swingably mounted on said carrier,

an electrical drive motor in said housing and having a motor output shaft disposed generally in axial alignment with said shaft means,

drive means including a plurality of drive elements mounted on said motor output shaft and rotatable therewith,

said levers having respective first arms engageable with said drive elements for transmitting driving torque to said levers and then to said carrier,

a control plate adjacent said carrier and movable toward and away from said carrier,

spring means biasing said control plate towards said carrier and causing said control plate to rotate with said carrier,

said levers having respective second arms disposed between said carrier and said control plate for moving said control

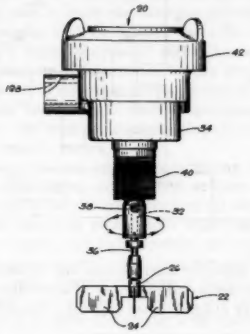


plate away from said carrier when the driving torque transmitted by said first arms increases due to increasing drag on said paddle means caused by the rising material,

and control switch means engageable by said control plate and operable in response to movement of said control plate away from said carrier.

4,551,664

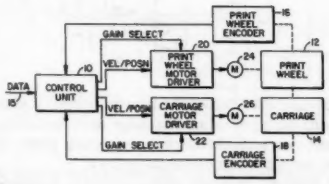
VELOCITY-POSITION SERVO WITH IMPROVED GAIN CONTROL

Harvey C. Wong, Kensington, and Frank W. Lin, Los Altos, both of Calif., assignors to Mechatron Systems, Inc., Sunnyvale, Calif.

Filed Sep. 27, 1983, Ser. No. 536,553

Int. Cl.⁴ G05B *11/18*

U.S. Cl. 318—592 **10 Claims**



1. A method for operating a rotary printer dual mode servo system having a velocity mode and a position mode, said method comprising the steps of:

(a) operating said servo system in the velocity mode with a first relatively high gain;

(b) switching said servo system to the position mode;

(c) operating said servo system in said position mode at said relatively high gain for a maximum predetermined time period; and

(d) reducing the gain of said servo system to a relatively low value after said maximum predetermined time period has elapsed without resumption of said velocity mode.

4,551,665

METHOD OF AND A DEVICE FOR CONTROLLING A STEPPING MOTOR

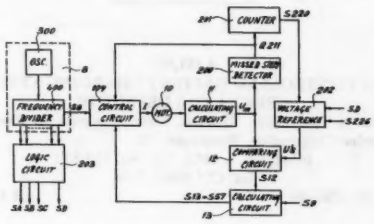
Luciano Antognini, La Chaux-de-Fonds, Switzerland, and Yves Guérin, St. Louis, France, assignors to ETA S.A. Fabriques D'Ebauches, Switzerland

Filed Jul. 31, 1984, Ser. No. 636,426

Claims priority, application Switzerland, Aug. 12, 1983, 4412/83

Int. Cl.⁴ H02K *29/04*

U.S. Cl. 318—696 **17 Claims**



1. A method of controlling a stepping motor having a rotor and a coil arranged to receive from a control device associated with the motor normal drive pulses for driving the rotor when the control device is supplied with a voltage, said method comprising measuring during each normal drive pulse a physical magnitude representative of the motion of the rotor, interrupting said drive pulse at an instant determined by the time taken by the physical magnitude to reach a reference level, and, additionally, detecting whether or not the rotor has rotated in response to said normal drive pulses and modifying said reference level according to information provided by such detection.

4,551,666

QUICK CHARGING APPARATUS

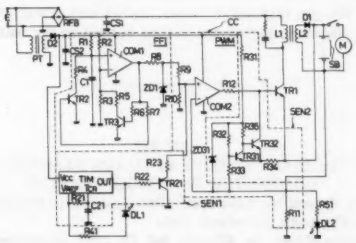
Sumio Wada, Yahata, and Satoru Inakagata, Hirakata, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 9, 1983, Ser. No. 502,548

Claims priority, application Japan, Jul. 31, 1982, 57-134509

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—20 **5 Claims**



1. A quick charging apparatus comprising means for feeding power from a apower source to a substantially dead secondary battery, a charge controlling means associated with said power feeding means and including means for adjusting fed power energy, means associated with said charge controlling means for feeding to said secondary battery a first average charging current of a relatively high level in a relatively short time so as to charge the battery with a required amount of energy for performing a single operation of an electric appliance to which said apparatus is applied, and means associated with the charge

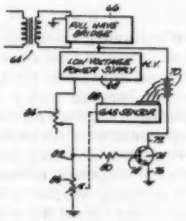
controlling emans for feeding to the battery a second average charging current of a relatively low level in a relatively long time so as to charge the battery to a level at least 80% of a fully chargeable amount of energy; said means for feeding said first average charging current including a first sensor for detecting said required amount of energy for said single operation in said secondary battery, and said means for feeding said second average charging current including a second sensor for detecting the amount of charge in the secondary battery.

4,551,667

GAS CONTROLLED BATTERY CHARGING SYSTEM USING A GAS DETECTOR

Gerald N. McAuliffe, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 7, 1983, Ser. No. 511,530
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—46 **8 Claims**



6. A device for controlling charging of a battery which gives off gas when more current is applied than is necessary for charging purposes, said device comprising means for generating a fixed control ramp waveform, electric circuit means for applying D.C. charging current to the battery, means including a resistance which changes as the gas concentration changes and connected in said circuit means for developing a control voltage varied by said resistance to progressively decrease the effective current applied to the battery as the gas concentration increases, and a comparator circuit comparing said control voltage and said ramp waveform and having an output signal which, when the ramp waveform exceeds the control voltage from the gas responsive means, causes said circuit means to apply the charging current to pass current to the battery.

4,551,668

VOLTAGE SENSING AT LOADS REMOTELY CONNECTED TO POWER SUPPLIES

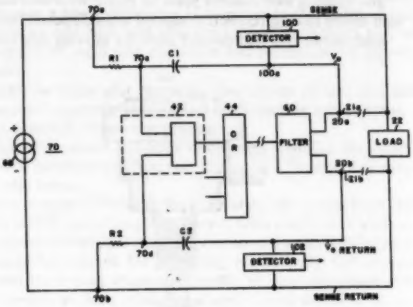
Neil A. Kammiller, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Division of Ser. No. 402,634, Jul. 28, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 603,139
Int. Cl.[4] G05F 1/46
U.S. Cl. 323—234 **6 Claims**

1. A circuit for sensing a break in at least one of a pair of sense leads in a power supply of the type which regulates the voltage at a remotely located load connected to said supply at its pair of output terminals said sense leads being connected to sense the voltage at said load, said circuit comprising:

(a) current source means connected to said sense leads to provide a current of predetermined polarity thereon;

(b) first detector means connected between one of said sense leads and one of said output terminals for generating a signal when said one sense lead is broken; and



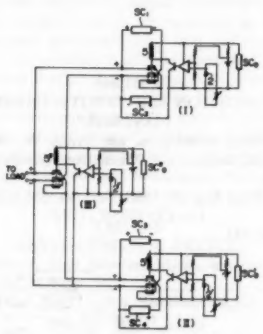
(c) second detector means connected between the other of said sense leads and the other of said output terminals for generating a signal when said other sense lead is broken.

4,551,669

PACKAGED SOLAR CELL APPARATUS

Hiroyasu Itoh, Kariya; Yasutoshi Suzuki, Oobu; Yasuhiro Horiuchi, and Kunihiko Hara, both of Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1983, Ser. No. 537,717
Claims priority, application Japan, Oct. 1, 1982, 57-171030
Int. Cl.[4] G05F 1/46; H01L 27/14
U.S. Cl. 323—268 **1 Claim**



1. A packaged solar cell apparatus comprising: a plurality of package units each one of said package units including:

(a) at least two sunlight electric generating means for converting sunlight into electrical energy;

(b) light intensity detector means including a photoelectric element for supplying an output voltage indicative of the intensity of sunlight to a load resistor connected to said photoelectric element and for producing an output signal formed by a voltage appearing across said load resistor;

(c) comparator means for comparing the output signal of said light intensity detector means with a reference voltage level to produce an output signal indicative of a result of the comparison;

(d) switching means for automatically switching the connection of said at least two sunlight electric generating means in accordance with the output signal of said comparator means; and

(e) third sunlight electric generating means, separate from

said at least two sunlight electric generating means, for actuating said switching means;

each of said package units having a light intensity self-deciding function for connecting said at least two sunlight electric generating means in series with each other when the output signal of said light intensity detector means has a level higher than the reference voltage level and for connecting said at least two sunlight electric generating means in parallel with each other when the output signal of said light intensity detector means has a level lower than the reference voltage level, thereby driving a desired electric load with maximum output electrical energy from said at least two sunlight electric generating means in response to the sunlight intensity detected by said light intensity detector means;

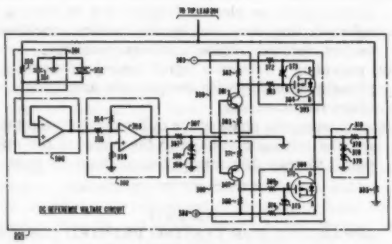
said packaged solar cell apparatus including a plurality of packaged units being constructed so that at least two packaged units therein are incorporated with a separate set of said switching means, said third sunlight electric generating means, said light intensity detector means and said comparator means which switches said at least two packaged units, thereby forming a packaged unit of a greater scale, and repeated formation and interconnection of said packaged units of a greater scale resulting in a large scale cell apparatus whereby said resultant large scale solar cell apparatus drives the desired electric load with maximum output electrical energy therefrom in response to a distribution of the sunlight intensity detected by said respective light intensity detector means.

4,551,670

CIRCUIT FOR MAINTAINING THE DC VOLTAGE ON AN ELECTRICALLY ISOLATED TELECOMMUNICATION LINE AT A REFERENCE LEVEL

James V. Anders, Lisle; Thomas W. Anderson, Warrenville; Daniel D. Geiger, West Chicago, and George F. Turnpaugh, Naperville, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 19, 1984, Ser. No. 602,148
Int. Cl.[4] G05F *1/46*
U.S. Cl. 323—281 **20 Claims**



1. A circuit for maintaining the DC voltage on an electrically isolated line at a reference level, comprising:

filter means for passing only the voltage on said line below a predetermined frequency,

difference means for subtracting the passed voltage from a reference voltage at said reference level to form a difference voltage,

first voltage-to-current means for sourcing current to said line to maintain the DC voltage on said line at said reference level when the polarity of said difference voltage is positive, and

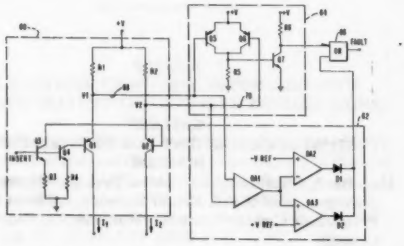
second voltage-to-current means for sinking current from said line to maintain the DC voltage on said line at said reference level when the polarity of said difference voltage is negative.

4,551,671

TERMINAL DISCONNECT AND MEDIA WIRE FAULT DETECT MECHANISM

Eugene J. Annunziata, and Thomas E. Stammely, both of Cary, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,252
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—51 **14 Claims**



1. An apparatus for testing and detecting wire faults in a local area network comprising:

a first circuit means operable to generate a pair of reference voltages;

electrical load means operable to control the magnitude of the reference voltages;

electrical conductor means operable to interconnect each of the reference voltages to the electrical load means; and

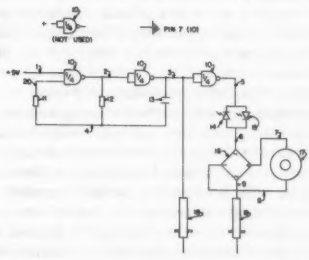
circuit means operable positioned for monitoring the reference voltages and to generate an error signal in the event that the magnitude of current flow in the conductor means exceeds a predetermined value.

4,551,672

ACTIVE PROBE

Russell F. Hadley, 5101 Fedora, Troy, Mich. 48098, and Carl W. Kovacs, 409 Curry, Royal Oak, Mich. 48067

Filed Dec. 19, 1983, Ser. No. 475,303
Int. Cl.[4] G01R *31/02, 31/08*
U.S. Cl. 324—133 **1 Claim**



1. An apparatus for screen testing and troubleshooting components, said apparatus comprising:

first circuit means, for generating a reversing voltage, consisting of one IC, two resistors and a capacitor;

probe means for applying said reversing voltage to a component under test and for carring current to said component under test;

light-emitting diodes means, in series with said probe means, for indicating current flow direction and for identification of undirectional components;

bridge rectifier means, in series with said probe means, for

generating a DC current in proportion to the current at the component under test;

audio buzzer means, for generating a sound in proportion to said current at the component under test, said audio buzzer means being energized by said bridge rectifier means.

4,551,673

TESTING ARRANGEMENT FOR PRINTED CIRCUIT BOARDS

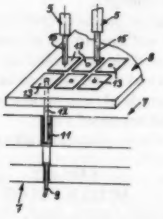
Hans Barth, Schallstadt, and Manfred Prokopp, Wertheim-Waldenhausen, both of Fed. Rep. of Germany, assignors to Riba-Prüftechnik GmbH, Schallstadt-Wolfenweiler, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,026

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038665

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—158 F **52 Claims**



1. An arrangement for testing a printed circuit board having printed conductor locations to be contacted during testing, said arrangement comprising:

(a) a plurality of contact members each of which is arranged to engage a respective printed conductor location;

(b) a corresponding plurality of leads for establishing electrical communication with a tester for the printed circuit board;

(c) support means intermediate said leads and said contact members, said support means having a surface which faces said contact members, and said surface having a plurality of spaced, substantially flat contacts arranged on a grid of predetermined area and each being in electrical communication with a respective contact member, said support means being replaceable to permit conversion of said arrangement from the testing of a printed circuit board with one distribution of printed conductor locations to the testing of a printed circuit board with another distribution of printed conductor locations, and a different one of said contacts being disposed at each intersection of said grid, said contacts having respective areas which are so large that the total area of said contacts significantly exceeds 50% of said predetermined area, and the width of the gap between each pair of neighboring contacts is significantly less than one-half of the dimensions of the respective contacts as measured along a direction bridging the gap; and

(d) a plurality of conducting elements each of which connects one of said contacts with a respective lead.

4,551,674

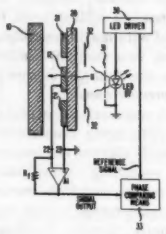
NONCONTACTING CONDUCTIVITY TYPE DETERMINATION AND SURFACE STATE SPECTROSCOPY OF SEMICONDUCTOR MATERIALS

Gabriel L. Miller, Westfield, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 12, 1982, Ser. No. 441,366

Int. Cl.⁴ G01R *31/26*

U.S. Cl. 324—158 R **15 Claims**



4. A method for capacitive conductivity type determination of at least a part of a sample of semiconductor material, the method comprising

(a) providing a source of above-bandgap amplitude modulated electromagnetic radiation, the amplitude varying periodically at a reference frequency;

(b) placing an electrode in proximity to, but spaced apart from, a surface of the sample, the electrode comprising a first electrode region and a second electrode region, at least the first electrode region being substantially transparent to the radiation, the first electrode region being conductively isolated from the second electrode region;

(c) irradiating, through the first electrode region, a part of the sample surface with the radiation, whereby the surface potential of the part of the sample surface is caused to vary at the reference frequency, substantially all of the irradiated surface part being directly facing the first electrode region and substantially none of the irradiated part being directly facing the second electrode region;

(d) providing, by conductive connection to the first electrode region, an electrical signal that is varying at the reference frequency, and, by conductive connection to the second electrode region, a reference voltage;

(e) providing a reference signal having substantially fixed phase relationship with the periodic amplitude variation of the radiation; and

(f) comparing the phase of the difference between the signal and the reference voltage to the phase of the reference signal, thereby determining the conductivity type.

4,551,675

APPARATUS FOR TESTING PRINTED CIRCUIT BOARDS

George Heys, Cambridge, and Dennis R. Coon, Byesville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 19, 1983, Ser. No. 562,795

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—158 F **4 Claims**

1. An apparatus for making temporary electrical connections to a plurality of electrical contact points on a surface of a printed circuit board or the like having said contact points arranged in an irregular pattern peculiar to a particular type of such board or the like in which the surface of the printed circuit board includes circuit elements extending a predetermined distance above the surface of said board, said apparatus comprising:

a housing member of insulating material having a continuous sidewall portion;

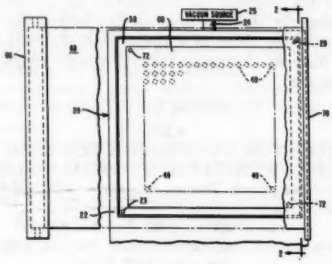
a first planar board member of insulating material having a

plurality of first probe assemblies and mounted within the housing member, said probe assemblies arranged in a fixed matrix pattern different from said irregular pattern of the contact points in the printed circuit board and each including a first sleeve member mounted in said first planar board member, a first stem member slidably positioned within the sleeve member and a first spring member mounted within said sleeve member and engaging said stem member for normally urging said stem member in a sensing direction;

a second planar board member of insulating material slidably mounted on said first board member and engaging said first stem members in a supporting relationship, said second board member including a plurality of second probe assemblies arranged in a pattern corresponding to the irregular pattern of the printed circuit board and in which each of said second probe assemblies includes a second sleeve member mounted in said second planar board member, a second stem member having a sensing head portion slidably positioned within said sleeve member and a second spring member located within said second sleeve member for normally urging said second stem member in a sensing direction;

means secured to said second planar board member for electrically connecting said first and second stem members upon mounting of said second planar board member on said first planar board member;

means for slidably mounting a printed circuit board on said



second planar board member wherein each of said second stem members engages an electrical contact point on the printed circuit board;

said second sleeve member including a shoulder portion formed on said second sleeve member and extending a predetermined distance away from said second planar board member and towards said printed circuit board for limiting the movement of said second stem member, said shoulder portion engaging the head portion of said second stem member upon movement of the second planar board member towards said printed circuit board, thereby preventing the second planar board member from engaging the circuit elements mounted on the printed circuit board;

a spring actuated supply roll of flexible cover material located adjacent said printed circuit board enabling the cover material to be removed from the roll and positioned over said printed circuit board and said housing member; and

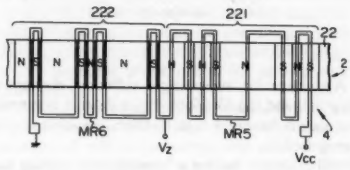
means connected to said housing member for applying a vacuum to the housing member whereby the cover material is moved into engagement with the sidewall portion of the housing member sealing the interior of the housing member enabling the applied vacuum to move the cover material, the printed circuit board and the second planar board member in a direction to move said first stem members into contact with said electrical connection means and said second stem members into contact with the contact points of the printed circuit board, thereby establishing electrical contact between the contact points of the printed circuit board and the first stem members.

4,551,676

PULSE CODER USING MAGNETORESISTANCE ELEMENTS HAVING AN IMPROVED Z-PHASE SIGNAL PATTERN

Yoichi Amemiya, Hachioji; Hiroshi Ishida, Hamuramachi; Yashitaka Takekoshi, and Shigeyuki Ushiyama, both of Hino, all of Japan, assignors to Fanuc Ltd, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,206
Claims priority, application Japan, Mar. 2, 1982, 57-31687
Int. Cl.[4] G01B *7/14*; G01P *3/42*; G08C *21/00*
U.S. Cl. 324—208 **6 Claims**



1. A pulse coder for generating a Z-phase signal for detecting a reference position of a rotating member, comprising:

a fixed member;

a rotating member rotatable with respect to said fixed member;

first and second magnetic patterns formed on a circumference of said rotating member, each of said magnetic patterns having strong magnetic field generating areas and weak magnetic field generating areas arranged alternately, irregularly and non-equidistantly spaced on said circumference; and

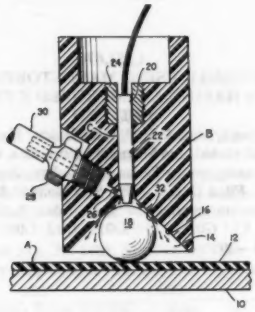
first and second magnetoresistance elements corresponding to said first and second magnetic patterns, respectively, formed on said fixed member, said first and second magnetoresistance elements being electrically connected in series with one another and operably connected to a Z-phase signal detection means,

said first and second magnetoresistance elements exhibiting a minimum resistance value and a maximum resistance value, respectively, when said first and second magnetic patterns of said rotating member are brought into directly facing relation with said first and second magnetoresistance elements, respectively, of said fixed member, such that when said magnetoresistance elements directly face said strong magnetic field generating areas of said magnetic patterns said magnetoresistance elements exhibit a minimum resistance value, and when directly facing said weak magnetic field generating areas of said magnetic patterns, said magnetoresistance elements exhibit a maximum resistance value, said reference position corresponding to a rotational position of said rotating member when one of said magnetoresistance elements is caused to exhibit a maximum resistance value and the other said magnetoresistance element is caused to exhibit a minimum resistance value such that the difference in resistance value between said respective first and second magnetoresistance elements is at a maximum.

4,551,677
APPARATUS AND METHOD FOR INSPECTING A BEARING BALL

Benjamin F. Bankston, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1983, Ser. No. 473,827
Int. Cl.⁴ G01N *27/90*; G01B *7/28*
U.S. Cl. 324—226 **15 Claims**



1. Apparatus for inspecting a spherical element such as a bearing ball and the like for surface defects comprising:

base means having a high-friction, non-abrasive base scanning surface;

a holding device having a housing for retaining said spherical element in a low-friction environment which includes a low pressure air layer which retains said spherical element for movement over said scanning surface;

an element retaining recess included in said holding device defined by a tapered recess wall tapering upwardly and inwardly to provide a progressively reducing cross-section which receives and accommodates a spherical element of different sizes for retention and movement with said holding device;

said recess including an enlarged open end for receiving said spherical element;

a defect-detecting probe means carried by said holding device extending into said recess in proximity to said spherical element for detecting surface defects in said spherical element;

means for delivering a flow of low pressure air into said recess and creating said low pressure air surface layer adjacent said wall of said recess to relieve the friction between said spherical element and said recess wall while effectively retaining said spherical element during scanning movement over said high-friction base scanning surface;

means establishing a predetermined pattern over which said holding device moves and said spherical element rolls over said base scanning surface during said scanning operation;

means for moving said holding device over said predetermined pattern;

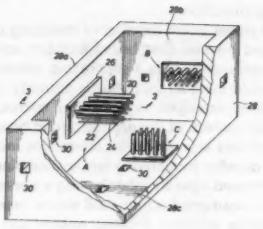
relative frictional forces produced on said spherical element between said low-friction air surface layer and said high-friction scanning base surface imparting a rolling movement to said spherical element; and

said spherical element being rolled and moved by said holding device over said base scanning surface according to said predetermined pattern whereby the entire surface of said spherical element is inspected by said defect-detecting probe means for surface defects.

4,551,678
PHANTOM FOR NUCLEAR MAGNETIC RESONANCE MACHINE

Tommie J. Morgan, 10718 Cranbrook, Houston, Tex. 77042, and M. Robert Willcott, 3502 Drummond, Houston, Tex. 77025

Filed Nov. 26, 1982, Ser. No. 444,620
Int. Cl.⁴ G01R *33/08*
U.S. Cl. 324—300 **9 Claims**

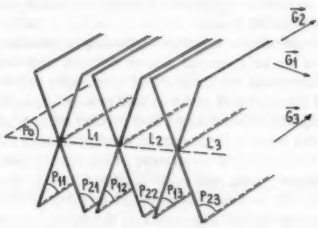


2. A phantom for an NMR machine comprising a plurality of tubes of non-magnetic mterial, such as glass, each of which contain a material having a known spin density, T1 or T2 characteristic that differs a preselected amount from the spin density, T1, or T2 characteristics of the material in the other tubes, said tubes having several different diameters ranging from a tube diameter that the machine cannot resolve up to a tube diameter that the machine can resolve and means for supporting the tubes in a predetermined arrangement in a NMR machine to measure the performance characteristics of the machine.

4,551,679
METHOD OF TOMOGRAPHIC SCANNING OF AN OBJECT BY NUCLEAR MAGNETIC RESONANCE

Jean Bossaert, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 12, 1983, Ser. No. 493,965
Claims priority, application France, May 14, 1982, 82 08483
Int. Cl.⁴ G01R *33/08*
U.S. Cl. 324—309 **9 Claims**



1. A method of tomographic scanning of an object by nuclear magnetic resonance, which consists in producing a nuclear magnetic resonance phenomenon in atoms of a selected element of said object which is placed in a directive magnetic field, then in measuring the characteristics of the rotating magnetic field radiated by said atoms in order to deduce therefrom a representation of their distribution within said object, wherein said method consists in reconstructing a tomographic image line by line by choosing each line at the intersection of two planes selected by two magnetic field gradients applied respectively at the same time as two successive excitation sequences which are capable of subsequently producing a spin echo phenomenon and by measuring said echo phenomenon in order to acquire said line, wherein two planes are selected

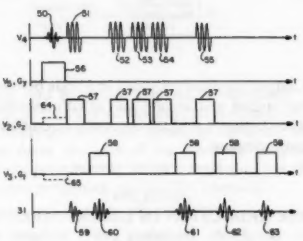
respectively from two groups of planes at each cycle of acquisition of a line, the two planes selected each time being separate and distinct from all the others in order to ensure that the surface defined by all the lines of intersection of the planes selected in pairs does not coincide with any of said planes.

4,551,680

SELECTIVE REGION NMR PROJECTION IMAGING SYSTEM

Albert Macovski, 2505 Alpine Way, Menlo Park, Calif. 94025

Filed Apr. 21, 1983, Ser. No. 487,294
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—309 **22 Claims**



1. In a method for forming a projection image of the NMR activity of a selected region of a volume the steps of:

exciting the selected region of the volume with a region-selecting excitation using a magnetic gradient having a component in the projection direction;

exciting a sequence of planar sections which are parallel to the projection direction and perpendicular to the projection image;

receiving signals from those regions which have experienced both excitations representing projections in solely one direction; and

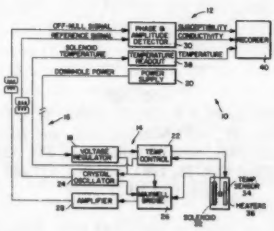
processing the received signals to form the projection image of the selected region of the volume.

4,551,681

MAGNETIC SUSCEPTIBILITY WELL-LOGGING UNIT WITH SINGLE POWER SUPPLY THERMOREGULATION SYSTEM

Robert L. Seeley, Denver, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 2, 1983, Ser. No. 490,276
Int. Cl.[4] G01V *3/26*; E21B *47/06*; H01F *27/08*
U.S. Cl. 324—333 **17 Claims**



1. A magnetic susceptibility well-logging system comprising surface electronic circuit means including a power supply, a well-logging cable means connected to said surface electronic circuit means and operative to conduct power from said power supply, and a magnetic susceptibility measuring circuit means connected to said well-logging cable means in spaced relationship to said surface electronic circuit means and operating to send data signals by current telemetry over said well-logged cable means to said surface electronic circuit means, said magnetic susceptibility measuring circuit means including voltage regulator means connected to said well-logging cable means to receive power from said power supply and operating to provide one or more regulated output voltages at a regulator output means, stabilized oscillator means connected to said regulator output means and operative to provide a reference signal, sensing bridge means connected to said regulator output means to receive said reference signal from said stabilized oscillator means, said sensing bridge means including a measuring probe means for sensing magnetic susceptibility which is connected to receive a regulated output voltage from said regulator output means, and detector means connected to said sensing bridge means and to receive said reference signal from said stabilized oscillator means.

9. A magnetic susceptibility well-logging system comprising:

surface electronic circuit means including a power supply;

a well-logging cable means connected to said surface electronic circuit means and operative to conduct power from said power supply;

a magnetic susceptibility measuring circuit means connected to said well-logging cable means in spaced relationship to said surface electronic circuit means, said magnetic susceptibility measuring circuit means operating to send data signals by current telemetry over said well-logging cable means and including probe means for sensing magnetic susceptibility;

said probe means including a heater means and a first and second temperature transducer means for sensing the temperature of said probe means and providing output signals which are a function of the magnitude of the sensed temperature and control means operative to receive said output signal from said first temperature transducer means and for providing a control signal which varies linearly and is inversely proportional to said first temperature transducer output signal, and power control means to receive said control signal and operative in response thereto to control the power to said heater means; and

conversion means in said susceptibility for measuring circuit connected to receive the output signal from said second temperature transducer means and for providing a voltage signal and voltage to current conversion means for receiving said voltage signal and providing a current signal on said well-logging cable means which is a function of said voltage signal.

4,551,682

DIGITAL SINE-COSINE GENERATOR

Albert J. Charpentier, Hatfield; James W. Redfield, Pottstown, and David W. DiOrio, Easton, all of Pa., assignors to Commodore Business Machines, Inc., West Chester, Pa.

Filed Jan. 3, 1983, Ser. No. 455,041
Int. Cl.[4] H03K *5/00*; H03B *19/00*
U.S. Cl. 328—22 **8 Claims**

1. An apparatus to digitally generate sine and cosine signals comprising:

means for providing a train of digital pulses;

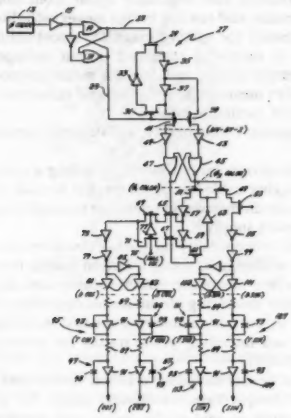
first digital divider means for dividing the output of the pulse train providing means by two, said digital divider means output being a first digital square wave pulse train signal at one-half the frequency of its input;

means connected to said digital divider means output for providing a second square wave pulse signal at the frequency of said digital divider means output and a third square wave pulse signal which is the inverse of said second square wave pulse signal and synchronized therewith;

second divider means connected to receive said second

square wave signal for dividing it by two to provide a fourth square wave pulse signal which is at one-half the frequency of said second square wave pulse signal and a fifth square wave pulse signal which is at one-half the frequency of said second square wave pulse signal and the inverse of said fourth square wave pulse signal and synchronized therewith;

third divider means connected to receive said third square wave pulse signal for dividing it by two to provide a sixth square wave pulse signal which is at one-half the frequency of said third square wave pulse signal and a sev-



enth square wave pulse signal which is at one-half the frequency of said third square wave pulse signal and the inverse of said sixth square wave pulse signal and synchronized therewith, said second divider means and said third divider means operation being synchronized;

wherein said fourth and fifth square wave pulse signals are displaced in time by one quarter of a period from the sixth and seventh square wave pulse signals, and

means connected to receive said fourth, fifth, sixth and seventh square wave pulse signals for integrating each into sinusoidal wave forms.

4,551,683

SWITCHED CAPACITOR FILTER CIRCUIT

Kenji Matsuo, Yokohama, and Shouji Abou, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 17, 1983, Ser. No. 553,022

Claims priority, application Japan, Nov. 19, 1982, 57-202946; Nov. 19, 1982, 57-202954

Int. Cl.⁴ H03H *11/40*; H03F *1/34*; H03K *3/013, 17/693*

U.S. Cl. 328—167 **18 Claims**

1. A switched capacitor filter circuit comprising:

a signal input terminal;

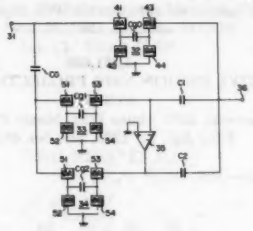
a first resistor circuit composed of a switched capacitor circuit with a negative equivalent resistance, connected at one end to said signal input terminal;

a first capacitor element connected at one end to said signal input terminal;

second and third resistor circuits composed of switched capacitor circuits with positive equivalent resistances, which resistor circuits are connected at one of their ends to the other end of said first capacitor element;

second and third capacitor elements connected respectively at one of their ends to the other ends of said second and third resistor circuits, and at their other ends to the other end of said first resistor circuit;

an amplifier circuit connected at the input terminal to a node between said second resistor circuit and said second capacitor element, and at the output terminal to a node between said third resistor circuit and said third capacitor element; and



a signal output terminal provided at a node between said first resistor circuit and second and third capacitor elements, or a node between said third resistor circuit and said third capacitor element.

4,551,684

NOISE REDUCTION IN LASER AMPLIFIERS

Anthony F. Bernhardt, Berkeley, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 4, 1983, Ser. No. 463,713

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 330—4.3 **4 Claims**

3. The method of enhancing the signal to noise ratio at the output of an optical amplifier stage, comprising the steps of

(a) introducing an optical signal to said amplifier stage,

(b) converging said optical signal to form a waist in the transverse extent of said optical signal,

(c) amplifying by stimulated emission phenomena said optical signal and concomitant spontaneous emission flux while carrying out said converging step,

(d) selectively transmitting said converging amplified optical signal from said amplifier stage while selectively attenuating substantially all nonconverging flux issuing from said amplifier stage, and

(e) diverging said converging amplified signal by an amount insufficient to substantially affect the intensity of said signal transmitting step thereof while diverging said nonconverging flux for attenuation of a still substantially greater portion thereof.

4,551,685

PROGRAMMABLE GAIN FEEDBACK AMPLIFIER

David V. Kerns, Jr., 1452 Mitchell Ave., and David V. Kerns, 418 Vinnedge Ride, both of Tallahassee, Fla. 32303

Filed Oct. 25, 1982, Ser. No. 437,482

Int. Cl.⁴ H03F *1/34*

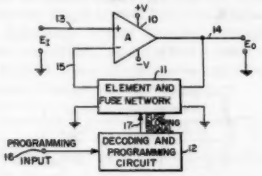
U.S. Cl. 330—86 **4 Claims**

1. A feedback amplifier contained in an integrated circuit, the gain of the amplifier can be permanently set after fabrication said feedback amplifier comprising

a high gain differential amplifier, referred to also as an operational amplifier,

a feedback network integrated with said high gain differential amplifier and consisting of multiple resistive means

each (or some) of which is associated with fusible means of predetermined current capacity, said feedback network being connected from the output of the high gain differential amplifier to the inverting input of said amplifier such that the effective signal attenuation of the feedback network controls the voltage gain of the feedback amplifier and



a decoding and programming means integrated with said feedback network whereby current is selectively directed to the appropriate fusible means to open electrically the selected fuses, the gain of the feedback amplifier circuit then being permanently set by the attenuation of the resistive means remaining electrically operative.

4,551,686

COUPLING FILTER, ESPECIALLY AN INPUT FILTER, FOR RECEIVERS OF CENTRALIZED RIPPLE CONTROL SYSTEMS

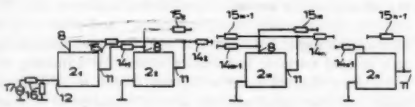
Hans Benzinger, Duisburg, Fed. Rep. of Germany, assignor to Thielscher-Electronic GmbH, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,966

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204508; Apr. 7, 1982, 3213098

Int. Cl.[4] H03F *1/34*

U.S. Cl. 330—100 **22 Claims**



1. A coupling filter, especially an input filter for receivers of centralized ripple control systems, with a multiplicity of similar four terminal networks (2), each four terminal network (2) having an input (8) and an output (11) and every two adjacent four terminal networks (2) being interconnected by means of two coupling admittances (14,15), wherein active RC four terminal networks (2) with at least one amplifier (7) are provided as four terminal networks, wherein the output (11) of the first RC four terminal network (2_1) is connected by way of a coupling admittance (14_1) to the input (8) of the second RC four terminal network (2_2) and the input (8) of the first RC four terminal network (2_1) is connected by way of another coupling admittance (15_1) to the output (11) of the second RC four terminal network (2_2), wherein, except for the first RC four terminal network (2_1) and the last RC four terminal network (2_n), the input (8) of each RC four terminal network (2_m) is connected on the one hand by way of a coupling admittance (14_{m-1}) to the output (11) of the preceding RC four terminal network (2_{m-1}), and on the other, by way of another coupling admittance (15_m) to the output (11) of the following RC four terminal network (2_{m+1}), and the output of each RC four terminal network (2_m) is connected, on the one hand, by way of a coupling admittance (15_{m-1}) to the input (8) of the preceding RC four terminal network (2_{m-1}), and on the other, by way of another coupling admittance (14_m), to the input of the following RC four terminal network (2_{m+1}), and wherein the output (11) of the last RC four terminal network (2_n) is connected by way of a coupling admittance (15_{n-1}) to the input of the next to last RC four terminal network (2_{n-1}) and the input (11) of the last RC four terminal network (2_n) is connected by way of another coupling admittance (14_{n-1}) to the output (11) of the next to last RC four terminal network (2_{n-1}).

4,551,687

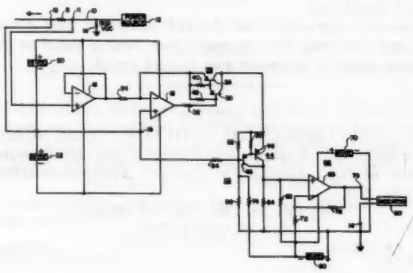
AMPLIFIER FOR MEASURING LOW-LEVEL SIGNALS IN THE PRESENCE OF HIGH COMMON MODE VOLTAGE

Fred E. Lukens, Littleton, Colo., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 7, 1984, Ser. No. 638,584

Int. Cl.[4] H03F *3/68*

U.S. Cl. 330—258 **15 Claims**



3. An amplifier circuit for measuring low level signals in the presence of widely ranging common mode voltages, said amplifier comprising:

means for current measurement sensing;

first biasing means for reducing the common mode voltage; said first biasing means coupled to said means for current measurement sensing;

a plurality of Darlington amplifier stages serially connected to each other, each said Darlington amplifier stage serially connected to said means for current measurement sensing for receiving an even amount of voltage between said Darlington amplifier stage; at least one of said Darlington amplifier stages serially connected through said first biasing means;

an output circuit means coupled to at least one of said Darlington stages, said output circuit comprising:

an amplifier, for amplifying the signals comprising a first operational amplifier with an inverting input terminal, a noninverting input terminal, an output terminal, said inverting input terminal connected directly to said output terminal through one of said Darlington amplifier stage amplifier stages, and said noninverting input terminal serially connected to said means for current measurement sensing;

a voltage divider serially connected to said amplifier between said amplifier and one of said Darlington amplifier stages, said voltage divider for in effect reducing voltage; and

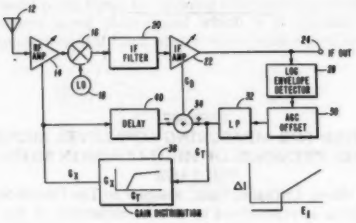
a second biasing means for in effect reducing the common mode voltage of said output circuit means.

4,551,688

DELAY COMPENSATED AUTOMATIC GAIN CONTROL

Robert L. Craiglow, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1984, Ser. No. 613,661
Int. Cl.[4] H03G 3/10
U.S. Cl. 330—280 11 Claims



1. An automatic gain control circuit comprising:

means for providing a first automatic gain control signal;

means for receiving said first automatic gain control signal and providing a delayed output of that first automatic gain control signal; and

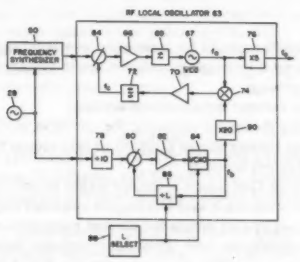
means for subtracting said delayed automatic gain control signal from said first automatic gain control signal to produce a second automatic gain control signal.

4,551,689

RF LOCAL OSCILLATOR WITH LOW PHASE NOISE

John Scala, Islip Terrance, and William Reuter, Ronkonkoma, both of N.Y., assignors to Comtech Telecommunications Corp., N.Y.

Filed Feb. 25, 1983, Ser. No. 469,636
Int. Cl.[4] H03L 7/00
U.S. Cl. 331—2 8 Claims



1. An RF local oscillator, responsive to a supplied reference signal for providing a signal at a desired selectable frequency, higher than the frequency of said reference signal and dependent on said reference signal frequency, comprising:

a phase stable crystal oscillator having a plurality of selectable crystals each for oscillating at a selected frequency, for providing a phase stable output signal at one of said selected frequencies which is separated from said desired higher frequency by the frequency of said reference signal;

a voltage controlled oscillator operating at said desired higher frequency; and

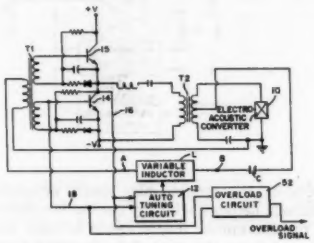
a phase locked loop having mixers coupled to receive said reference signal and said phase stable output signal, and including said voltage controlled oscillator, for controlling the output of said voltage controlled oscillator thereby to develop said signal at said desired frequency.

4,551,690

AUTOMATIC TUNING CIRCUIT FOR USE IN AN ULTRASONIC APPARATUS

Eric Quist, Roxbury, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Continuation of Ser. No. 359,214, Mar. 18, 1982, abandoned.
This application Dec. 13, 1984, Ser. No. 681,085
Int. Cl.[4] H03L 7/00
U.S. Cl. 331—36 L 5 Claims



1. A power supply circuit for driving an electroacoustic converter comprising an oscillatory circuit including switching means for providing at an output a high frequency electrical signal at a predetermined frequency for energizing an electroacoustic converter wherein the improvement comprises:

a feedback loop including an electrically variable inductance means coupled between the output and an input of said oscillatory circuit for providing a portion of said high frequency electrical signal at the output of said oscillatory circuit to an input of said oscillatory circuit, and

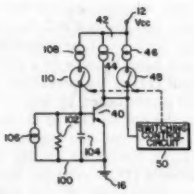
an automatic tuning circuit coupled to said switching means and said variable inductance means for receiving a first signal commensurate with the voltage across said switching means and a second signal commensurate with the current through said switching means, and providing an adjustment signal responsive to said first and second signals to said variable inductance means for adjusting the inductance thereof from a nominal value to a value to cause said first signal and said second signal to be in phase with each other.

4,551,691

HYSTERESIS CIRCUIT WITH SMALL HYSTERESIS AMPLITUDE AND OSCILLATOR USING THE HYSTERESIS CIRCUIT

Atsushi Ogawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 29, 1983, Ser. No. 537,064
Claims priority, application Japan, Sep. 29, 1982, 57-170376; Sep. 29, 1982, 57-170387
Int. Cl.[4] H03K 3/26
U.S. Cl. 331—111 10 Claims



1. A hysteresis circuit comprising:

a power source;

a reference potential source;

input means operative in one of two conductive states connected to said reference potential source for receiving an input signal;

a constant current source connected between said power source and said input means providing first and second current levels to said input means corresponding to said two respective conductive states;

output means responsive to said first and second levels of current for deriving a bilevel hysteresis output signal; and

means for detecting current flowing through said input means and controlling said current source between said first and second levels of current in response to said current flowing through said input means.

4,551,692

MONOLITHIC POLARIZER GRATING

Peter W. Smith, Westport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 28, 1984, Ser. No. 594,100

Int. Cl.⁴ H01P *1/16*

U.S. Cl. 333—21 A **3 Claims**

1. In a substrate of dielectric material subject to incident propagating polarized microwave radiation capable of vector resolution with respect to components of a selected reference frame perpendicular to the direction of propagation, a monolithic polarizer comprising:

first anisotropic matching means for countering the reflection of microwave radiation;

anisotropic means adjacent said first matching means for transforming between linear and circular polarization states;

second matching means for countering the reflection of microwave radiation; and

isotropic means for providing structural support with respect to said anisotropic means, said first and second matching means straddling said anisotropic and isotropic means, said isotropic and said anisotropic means cmprising the same material, whereby said incident propagating polarized microwave radiation changes polarization state in passing through said matching isotropic and said anisotropic means.

4,551,693

COAXIAL MICROWAVE LOAD ISOLATOR OF THE THREE-PLATE TYPE INCLUDING SUCH A LOAD AND USE OF SUCH AN ISOLATOR

Jacques Guidevaux, Chatillon sous Bagneux, France, assignor to Thomson CSF, Paris, France

Filed Nov. 16, 1983, Ser. No. 552,105

Claims priority, application France, Nov. 19, 1982, 82 19429

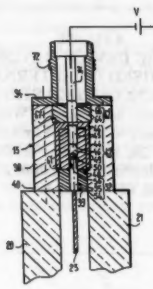
Int. Cl.⁴ H01P *1/26, 1/36*

U.S. Cl. 333—22 R **13 Claims**

1. A coaxial microwave load comprising:

a first assembly including a cylindrical conductive body, a first cylindrical rod lodged inside said body, made of insulating material and covered with a resistive layer, said first rod having first and second metallized ends, and a first washer of insulating material interposed between said body and said first rod, said first assembly constituting a first coaxial transmission line having a given characteristic impedance to which said resistive layer of said first rod is mateched; and

a mounting block made of conductive material and having a



central bore for receiving said first assembly, said mounting block having an inside surface and an outside surface both of which are covered with an insulating layer, whereby said load is DC isolated once said first assembly is lodged in said mounting block.

4,551,694

COUPLING ARRANGEMENT FOR A CAVITY RESONATOR

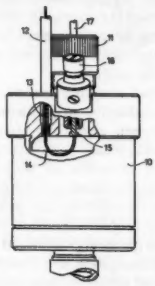
Reinhard Biehl, Karlsruhe; Dieter Schmalbein, Marxzell-Burbach, and Günther Laukien, Rheinstetten, all of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,728

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300766

Int. Cl.⁴ H01P *5/04, 7/06*

U.S. Cl. 333—24 C **11 Claims**



1. A coupling arrangement for coupling a high frequency electrical signal into a cavity resonator through a metallic wall portion thereof by means of a coaxial transmission line having an inner and an outer conductor, the outer conductor being in electrical conductive connection with said metallic wall portion with the inner conductor in spaced electrically insulating relation to the outer conductor, the improvement consisting in that for coupling the high frequency electrical signal into the resonator the inner conductor of the coaxial transmission line is extended for connection, in form of a loop, to a manually adjustable loop holder assembly comprising a threaded electrically conductive sleeve in electrical connection with a wall of the cavity resonator, a screw of dielectric material having first and second threads, the first thread being in engagement with the threads on the sleeve, and a threaded connector element of

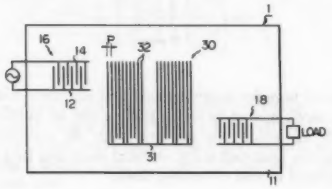
electrically conductive material the threads of which are threadedly engaged with said second threads on the screw of dielectric material, said extended inner conductor being connected at its free end to said electrically conductive connector element.

4,551,695

SURFACE ACOUSTIC DEVICE HAVING MULTISTRIP COUPLER COMPRISED OF ALTERNATE COUPLED AND UNCOUPLED STRIPS

Shigeo Tanji, Yokohama, and Noboru Wakatsuki, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1983, Ser. No. 508,546
Claims priority, application Japan, Jun. 29, 1982, 57-111888
Int. Cl.⁴ H03H *9/25*
U.S. Cl. 333—195 **7 Claims**



1. A surface acoustic wave device comprising:

a piezoelectric substrate;

first electrode means, having a set of interdigital electrodes formed on the surface of said piezoelectric substrate, for generating surface acoustic waves on the surface region of the substrate when an electric signal is applied between two of said interdigital electrodes in said set of interdigital electrodes;

second electrode means having two interdigital electrodes formed on the surface of said piezoelectric substrate, the center of said second electrode means being spaced at a distance from the center of said first electrode means in the direction of propagation of the surface acoustic waves which is oriented transverse to said interdigital electrodes, and generating an output electrical signal between said interdigital electrodes in response to the generated surface acoustic waves; and

electromechanical coupling means, having a plurality of electrically conductive strips formed on said piezoelectric substrate between said first electrode means and said second electrode means and oriented substantially perpendicular to the direction of propagation of the surface acoustic waves, for receiving the generated surface acoustic waves and transmitting the generated surface acoustic waves to said second electrode means, said electrically conductive strips being arranged in parallel, along the direction of propagation of the surface acoustic waves, at a predetermined distance from each other, and in a repeating pattern including two consecutive electrically conductive strips connected at a predetermined position in the direction of propagation of the surface acoustic waves followed by two consecutive unconnected electrically conductive strips.

4,551,696

NARROW BANDWIDTH MICROSTRIP FILTER

Michael F. Moutrie, Buffalo Grove; Raymond L. Sokola, Lake Zurich, and Charles Choi, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

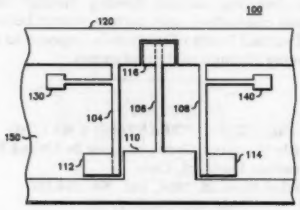
Filed Dec. 16, 1983, Ser. No. 562,330
Int. Cl.⁴ H01P *1/203, 7/08*
U.S. Cl. 333—204 **12 Claims**

1. A microstrip transmission line filter having a predetermined signal frequency passband, comprising:

a substrate having a first surface and an electrically grounded second surface;

at least two electrically conductive, opposingly disposed grounded portions on the first surface of said substrate;

a plurality of substantially parallel electrically conductive strips disposed on the first surface of said substrate and each having a free end and a grounded end coupled to one of said grounded portions;



at least two capacitive loading means disposed on the first surface of said substrate and each coupled to a different one of the free ends of said strips coupled to the same one of said grounded portions; and

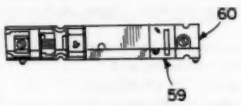
one of said grounded portions further including at least one additional electrically conductive grounded portion interposed at least partially between said two capacitive loading means.

4,551,697

CURRENT LIMITING CIRCUIT BREAKER MECHANISM

Frank W. Kussy, 2A Willow Brook Ct., Randallstown, Md. 21133

Filed Jan. 23, 1984, Ser. No. 573,157
Int. Cl.⁴ H01H *75/00*
U.S. Cl. 335—16 **10 Claims**



1. Multipole circuit breaker each pole having a mechanism consisting of a molded first lever operated by a metallic shaft, this shaft connecting all poles this shaft not needing an insulating cover, this first lever guiding when rotated a movable contact arm, this contact arm being under influence of an over the center spring, one end of this spring held in a cradle, a second end of this spring held in said movable contact arm, so dividing said contact arm in a first and second section, this first section being positioned between a first end of the movable contact arm and a hook of the spring where this first end can turn in said molded first lever and a second section of the movable contact arm which is positioned between the hook of the spring and a contact point, an approximately L-shaped fixed contact arm, one leg or at least a part of this leg being closely positioned to the second section of this movable contact arm or at least a large part of it, when the circuit breaker is in the "ON" position, and these two sections or at least parts of these two sections of the fixed and movable contact arms being approximately parallel, the current in these two sections flowing in opposite direction that the movable contact arm blows open by the electrodynamic forces at severe fault currents.

4,551,698

POLARIZED ELECTROMAGNETIC RELAY

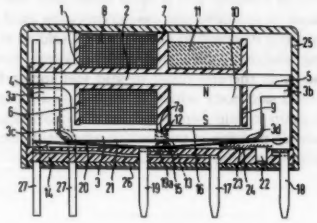
Martin Aidn, Degerndorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,466

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303665

Int. Cl.[4] H01H *51/22*

U.S. Cl. 335—78 24 Claims



1. A polarized electromagnetic relay comprising:

a housing,

a coil core within said housing,

a coil body positioned along said core,

at least one coil winding positioned along said coil body,

a rocker armature pivotally mounted at its center portion beneath said coil, said rocker armature having opposed end portions providing working air gaps with respective ends of said core, the ends of said rocker armature disposed adjacent the ends of said coil core,

a permanent magnet disposed at one side of said coil winding, said permanent magnet having one pole in close proximity to said coil core,

a pedestal positioned in said housing,

stationary contacts secured to said pedestal, and

spaced movable contact elements on said pedestal below said rocker armature being disposed between said pedestal and said coil body and positioned to be selectively actuated by rocking movement of said rocker armature.

4,551,699

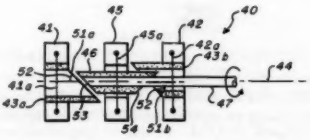
ROTARY VARIABLE DIFFERENTIAL TRANSFORMER

Joannes N. M. de Jong, Westford, and Richard L. Earle, Mendon, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Division of Ser. No. 506,929, Jun. 22, 1983, abandoned. This application Apr. 8, 1985, Ser. No. 721,121

Int. Cl.[4] H01F *21/06*

U.S. Cl. 336—135 6 Claims



1. A rotary variable transformer comprising:

electrically coupled first and second coils of electrical conducting material cylindrically wound about a longitudinal axis forming first and second hollow cylinders respectively;

a third coil of electrical conducting material positioned between said first and second coils and cylindrically wound about said longitudinal axis forming a third hollow cylinder;

first and second rings of circumferentially continuous magnetic susceptible material respectively positioned in said first and second hollow cylinders, each having an extension toward said third hollow cylinder configured to have a circumferential variation of magnetic susceptible material; and

a core of circumferentially continuous magnetic susceptible material rotatably positioned in said third hollow cylinder having extensions towards said first and second hollow cylinders configured to have a circumferential variation of magnetic susceptible material to provide maximum magnetic coupling with said extension of said first ring and minimum magnetic coupling with said extension of said second ring for at least one angular rotation position and to provide maximum magnetic coupling to said extension of said second ring and minimum magnetic coupling to said extension of said first ring at preselected angles from each of said at least one angular rotation position.

4,551,700

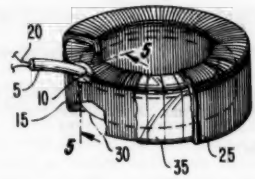
TOROIDAL POWER TRANSFORMER

Anders Waldemar, Rottne, Sweden, assignor to Toroid Transformator AB, Växjö, Sweden

Filed Mar. 14, 1984, Ser. No. 589,693

Int. Cl.[4] H01F *15/10*

U.S. Cl. 336—192 4 Claims



1. A toroidal power transformer having a primary and a secondary winding and comprising:

a toroidal shaped core;

a primary winding wound about said core, having primary lead wires, and having an annular end surface and a cylindrical side surface forming a shoulder therebetween;

sleeve insulator means, having a tube portion and having a flange portion connected to the tube portion with no gaps therebetween and formed continuously about the tube portion such that the flange portion conformingly and continuously covers part of the annular end surface, part of the cylindrical side surface and part of the shoulder in the region around said primary lead wires, for housing said primary lead wires, for positioning said primary lead wires outward from said primary winding and for providing creepage distance between said primary winding and said secondary winding in said region around said primary lead wires;

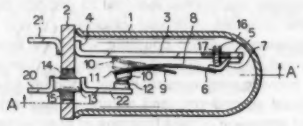
a wrapped insulator, overlappingly wrapped around said primary winding and said flange portion of said sleeve insulator means; and

said secondary winding wound about said wrapped insulator and above said flange portion of said sleeve insulator means and having secondary lead wires.

4,551,701
THERMALLY ACTUATED SWITCHING DEVICE

Susumu Ubukata, 549-banchi, Nakasuna-cho, Tempaku-ku, Nagoya, Japan, and Yasukazu Mizutani, Nagoya, Japan, assignors to Susumu Ubukata, Japan

Filed May 17, 1984, Ser. No. 611,177
Int. Cl.[4] H01H *61/00, 71/16*
U.S. Cl. 337—97 **5 Claims**

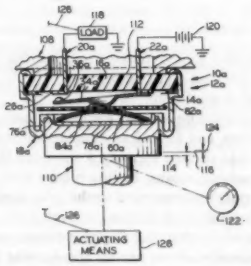


1. A thermally actuated switching device comprising:
(a) a thermally actuated member having a fixed end, a free end and an intermediate central dish-shaped portion to induce snap movement, the fixed end being supported by a stationary member;
(b) a movable contact secured to the free end of said thermally actuated member in making and breaking relationship with a fixed contact at selected temperature, an arc being generated upon breaking contact between the movable and fixed contacts; and
(c) an arc shield made of a heat-resistant material, one end of the arc shield being cantileverly secured to the free end of the thermally actuated member adjacent to the movable contact, said arc shield extending when said member snaps and snaps back, the arc shield being positioned and adapted so as to shield the dish-shaped portion from the said arc.

4,551,702
THERMOSTATIC SWITCH AND METHOD OF MANUFACTURE

Charles J. Hire, Mansfield, Ohio, assignor to Hi-Stat Manufacturing Company, Inc., Lexington, Ohio

Continuation of Ser. No. 257,705, Apr. 27, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 573,847
Int. Cl.[4] H01H *37/12*
U.S. Cl. 337—347 **37 Claims**

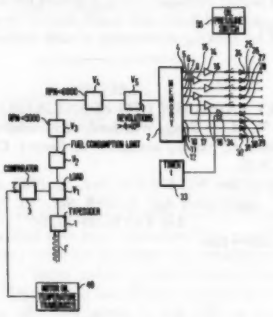


1. A condition responsive switching device comprising a cup-shaped case having an open end and providing an axially extending inner wall, a body secured in axially abutting assembled relationship to said case as to close said open end, said body and said case when in said assembled relationship cooperating to define a chamber, a switch mounted on said body in said chamber providing a fixed electrical contact and a cantilever mounted leaf spring mounted at one end on said body, the axial location of said switch relative to said axially extending inner wall being determined by said axially abutting assembled relationship of said body to said cup-shaped case, the free end of said leaf spring overlying said fixed contact and providing mobile contact means movable into and out of engagement with said fixed contact to close and open said switch, a snap disc in said chamber on the side of said leaf spring remote from said body, said snap disc being movable between two positions of stability in response to two different predetermined environmental conditions, the central portion of said snap disc moving from each position of stability to the other position of stability first with a predetermined amount of creep movement followed by snap movement, said disc and leaf spring being operably connected so that said switch is closed when said disc is in one position of stability and is open when said disc is in the other position of stability, said case comprising axial end wall means oppositely disposed to said open end, said axial end wall means being selectively deformed axially inwardly toward said chamber so as to thereby result in said leaf spring being deflected toward said body which is secured in an axially abutting relationship to said cup-shaped case by said disc beyond the initial closed position of said switch when said disc is in said one position of stability.

4,551,703
SERVICE INTERVAL SIGNALLING DEVICE FOR PRIME MOVERS

Fritz Bourauel, and Walter Weishaupt, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

PCT No. PCT/EP82/00081, § 371 Date Dec. 7, 1982, § 102(e) Date Dec. 7, 1982, PCT Pub. No. WO82/03714, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 8, 1982, Ser. No. 448,849
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114689
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 D **19 Claims**

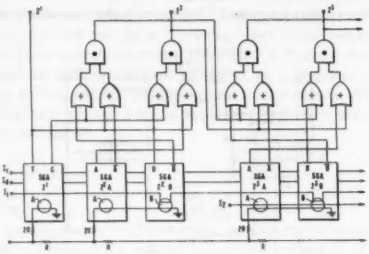


1. A service interval indicating device for engines wherein a service interval is divided into plural serial equal increments, the engine having an output shaft for driving apparatus, comprising
a signal generator means responsive to a plurality of threshold values of different characteristic operating parameters for generating a first signal,
means responsive to the output shaft for actuating the signal generator means in accordance with the total number of revolutions of the output shaft,
a plurality of control lights each assigned to a single increment of the service interval,
means for controlling extinction of each of said control lights as the corresponding increment of the service interval is completed.

4,551,704
LOOK-BACK ANALOG TO DIGITAL CONVERTER

Carl J. Anderson, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1983, Ser. No. 536,429
Int. Cl.[4] H03K *13/22*
U.S. Cl. 340—347 AD 6 Claims



1. An ordered register subsystem, for a high speed data processing system, having interconnected analog input means, register/encoder means and output utilization means

characterized by

(a) base sampling register means, having ordered bit positions settable to analog threshold values in response to an analog input signal, connected to the analog input means, forming part of the register/encoder means;

(b) offset sampling register means, having ordered bit positions settable to analog threshold values in response to an analog input signal, connected to the analog input means, forming part of the register/encoder means;

(c) base sampling interval phasing means connected to said base sampling register means in sampling control configuration;

(d) offset sampling interval phasing means, offset in phase from said base sampling interval phasing means, connected to said offset sampling register means in sampling control configuration;

(e) sample encoding means, connected to said base and offset sampling register means, responsive to threshold value settings of said base and offset sampling register means, and to its own output signals from respectively lower bit order positions, to encode in sequence, on a bit order position basis, as a function of respective next lower order bit position bit values, the respective composite values of respective next lower order bit position and of said base sampling register means, or alternatively the composite values of respective next lower order bit position and of offset sampling register means.

4,551,705
PROGRAMMABLE INTEGRATED CIRCUIT AC RESISTOR NETWORK

Robert D. Andersen, West Covina, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 278,926, Jun. 30, 1981, abandoned. This application Jan. 21, 1983, Ser. No. 460,100
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA 7 Claims

1. A digitally programmable AC resistor network comprising:

a monolithic body of semiconductor material having a plurality of ideally identical field effect transistor cells formed thereon, said cells being subject to unavoidable minor variations in characteristics, each field effect transistor cell having source, drain and gate regions, the electrical resistance between the source and drain regions varying with the voltage applied to the gate region, minimum source-drain resistance occurring in respnse to a gate voltage at least as great as a saturation value;

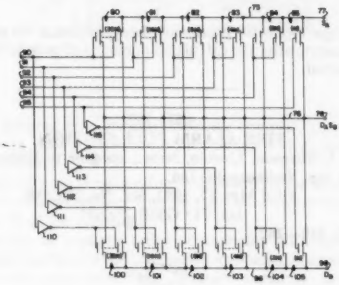
a first conductor connecting the source regions of at least a first group of said cells to a first output terminal;

a second conductor connecting the drain regions of the first group of said cells to a second output terminal;

a third conductor connecting the drain regions of a second group of said cells to a third output terminal, the source regions of the second group of said cells being connected to said second output terminal;

a plurality of control terminals;

control conductor means individually connecting each control terminal to the gate regions of a distinct set of cells in said first group of cells so that the gate region of each cell in the first group of cells is connected to only one control terminal



and each control terminal is connected to the gate regions of a predetermined plurality of cells, whereby variations of the characteristics of individual cells are averaged out to result in electrical resistance between the first and second output terminals which is inversely proportional to the number of cells in the sets of cells whose gate regions are supplied with voltages at least as great as the saturation value; and

inverter means individually connecting each control terminal to the gate regions of a distinct set of cells in said second group of cells so that the gate region of each cell in said second group of cells is connected through an inverter to only one control terminal and each control terminal is connected through an inverter to the gate region of a predetermined plurality of cells, whereby the resistor network is operable as a digitally controlled variable voltage divider.

4,551,706
APPARATUS FOR DECODING RUN-LENGTH ENCODED DATA

David J. Hunt, Hitchin, United Kingdom, assignor to International Computers Limited, London, England

Filed May 2, 1984, Ser. No. 606,382
Claims priority, application United Kingdom, May 14, 1983, 8313331
Int. Cl.[4] G08C *9/00*
U.S. Cl. 340—347 DD 9 Claims

1. Apparatus for decoding run-length encoded data, comprising:

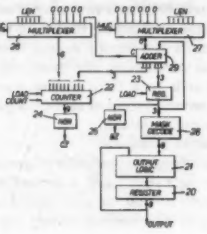
(a) an input for receiving a succession of run-length codes each of which represents the length of a run of signals of the same value,

(b) an output for outputting a succession of groups of signals, each group containing a predetermined number n of signals which are output in parallel,

(c) a position register for storing an indication of the position, within a group of signals, of the latest transition between signal values,

(d) calculation means for using the contents of the position register and the received run-length code to calculate the number x of groups to be output before the next transition,

and the position within the group of that next transition, and



(e) logic means for producing the transition at the calculated position after the calculated number x of groups have been output.

4,551,707

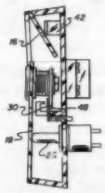
FIRE ALARM PULL STATION

Roger A. Simpson, Lincoln, Nebr., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 27, 1982, Ser. No. 382,388

Int. Cl.[4] G08B *25/100*

U.S. Cl. 340—287 **6 Claims**



1. A double action alarm station comprising:

(a) a frame,

(b) a back plate carried by said frame providing a compartment,

(c) latch means carried by said back plate,

(d) a first door pivotally mounted at an end of said frame to be manually pushed inwardly and partially covering a side opposite said back plate,

(e) a second door pivotally mounted at an opposite end of said frame to be manually pulled outwardly after pushing said first door inwardly and covering the remainder of said side,

(f) cam means carried by said second door engaging said latch means, and

(g) a switch closing in response to an opening of said second door and having a terminal block receiving electrical wiring from an alarm to complete an electrical circuit thereto.

4,551,708

REACTANCE-COMMUTATED HIGH RESOLUTION SERVO MOTOR SYSTEM

Ross D. Welburn, Santa Rosa, Calif., assignor to Motornetics Corporation, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 385,034, Jun. 4, 1982, Pat. No. 4,501,980, and Ser. No. 531,292, Sep. 12, 1983, Pat. No. 4,458,168. This application Nov. 29, 1983, Ser. No. 556,083

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 SY **7 Claims**

1. A position sensing device comprising

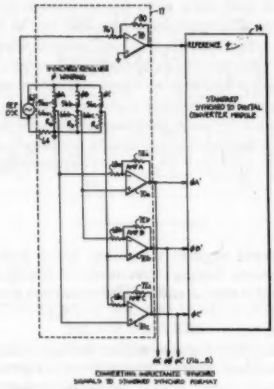
a first stator having a plurality of pole pieces,

a plurality of first coil windings, each pole piece of the first stator having a single one of the first coil windings wound on it, and with the first coil windings being connected together in a plurality of phases,

rotor means positioned adjacent the first stator's poles, and movable with respect to them, for changing the inductance of the first coil windings as a function of the position of the rotor means relative to the first stator's poles,

oscillator means for supplying an alternating current reference signal to the first coil windings,

first current sensing means for detectining the magnitude of the



alternating currents flowing through each phase of the first coil windings,

first differential means connected to the first current sensing means for determining the differences in the magnitudes of such alternating currents between each phase and for amplifying such differences, and

first comparing means for comparing the phase of each of the current magnitude differences with the phase of the alternating current reference signal to produce a first output signal which is relative to the first stator.

4,551,709

INTEGRABLE DIGITAL/ANALOG CONVERTER

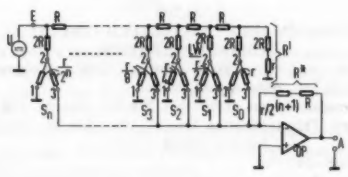
Kamal Merchant, Holzkirchen, and Claude Schmitt, Ebersberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,300

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145889

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 DA **9 Claims**



1. Integrable digital/analog converter, comprising a reference d-c voltage or current source having first and second terminals, an R/2R ladder network having a given base resistance R, having an input connected to said first terminal of said reference d-c source and having outputs, a plurality of double-throw switches having two switching positions including a switch carrying the smallest current and a switch carrying the

largest current, each of said switches being in the form of a pair of transistors being controlled together by a digital signal to be evaluated, said double-throw switches each having a first current-carrying terminal connected to said second terminal of said reference d-c source through ground, a second current-carrying terminal carrying current in both of said switching positions each being connected to one of said outputs of said R/2R ladder network, and a third current-carrying terminal, a commom operational amplifier forming an output of the converter and and having an inverting input connected to each of said third current-carrying terminals, a resistor being connected to said operational amplifier in a negative feedback loop, and means for weighting said double-throw switches to individually set the internal resistance θ_i thereof according to the relationship:

$$\theta_i = r/2^i,$$

where:

i is the number of said respective double-throw switch which decreases with decreasing current load of said double-throw switches through said R/2R ladder network, and said double-throw switch carrying the smallest current is given the number 0, said resistor in said negative feedback loop of said operational amplifier having a resistance value being equal to the sum of one-half the internal resistance of said double-throw switch carrying the largest current and said base resistance of said R/2R ladder network.

4,551,710

METHOD AND APPARATUS FOR REPORTING DANGEROUS CONDITIONS

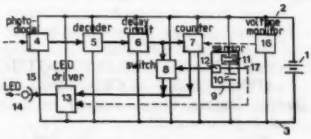
Alan P. Troup, Männedorf; Hannes Güttinger, Stäfa, and Gustav Pfister, Uetikon, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Apr. 19, 1984, Ser. No. 602,127

Claims priority, application Switzerland, Apr. 29, 1983, 2375/83

Int. Cl.⁴ G08B *26/00*

U.S. Cl. 340—505 **11 Claims**



1. A method of signal transmission and signal processing in an alarm system comprising a central signal station and remotely located detectors, comprising the steps of:

transmitting an interrogation signal to said detectors from said central signal station;

transmitting response signals from said detectors after a time delay characteristic of each individual detector back to the central signal station after receiving said interrogation signal;

said response signals corresponding to a current state of the individual detector;

receiving and evaluating the response signals at the central signal station;

the detectors transmitting the response signals after every n^{th} interrogation signal when in an alarm state; and

the detectors transmitting response signals only after every m^{th} interrogation signal when in an operationally ready state and the alarm state is absent;

wherein;

m and n are integers; and

m is greater than n.

4,551,711

INFRARED-TYPE INTRUSION DETECTOR

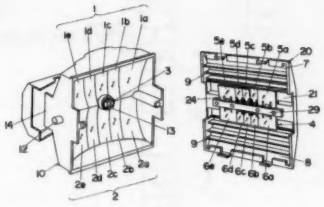
Shoichi Akiyama, and Mikio Kondo, both of Tsu, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 30, 1984, Ser. No. 575,405

Claims priority, application Japan, Aug. 26, 1983, 58-156995

Int. Cl.⁴ G08B *13/18*

U.S. Cl. 340—567 **10 Claims**



1. An infrared-type intrusion detector comprising:

a housing with at least one front opening and an inner bottom surface;

a single infrared sensing element disposed on the side of said inner bottom surface with its optical axis extending fore and aft of the housing;

a plurality of concave reflector segments disposed on the bottom surface of the housing for providing separate fields of view and collecting infrared radiation therefrom through said front opening;

plane mirror means disposed forwardly of the concave reflector segments within the housings for reflecting said infrared radiation once reflected from said concave reflector segments and focusing it upon said infrared sensing element;

electrical circuit means responding to the infrared detection by the sensing element to produce a cautionary signal; and

means for selectively interrupting one or more paths between the respective concave reflector segments and the sensing element, said means for selectively interrupting comprises an assembly of plane mirrors defining said plane mirror means, each plane mirror corresponding to each one of said concave reflector segments and being pivoted at its one end to a front cover of the housing so as to be movable between an operative position where it focuses the infrared radiation reflected from the corresponding concave reflector segment upon the sensing element and an interrupting position where it fails to focus the infrared radiation reflected from the corresponding concave reflector segment upon the sensing element.

4,551,712

ELECTRONIC DETECTION SYSTEM FOR DETECTING A RESPONDER INCLUDING A FREQUENCY DIVIDER

Tallienco W. H. Fockens, Eibergen, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands

Filed May 14, 1982, Ser. No. 378,244

Claims priority, application Netherlands, Jan. 14, 1982, 8200138

Int. Cl.⁴ G08B *13/24*

U.S. Cl. 340—572 **20 Claims**

1. In an electronic detection system, comprising:

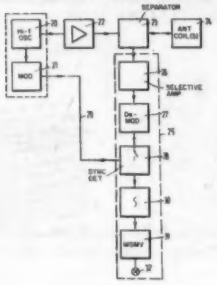
transmitter means for generating an interrogation field, said transmitter means being coupled with at least one transmitting antenna coil;

responder means including a receiving coil for receiving a signal having a signal frequency and a transmitting coil for transmitting a signal in response to said interrogation field; and

receiver-and-detector means coupled with at least one re-

ceiving antenna coil for receiving and further processing the signal transmitted by said responder means;

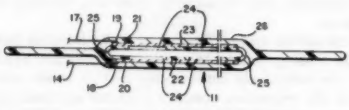
the improvement wherein said receiving coil and said transmitting coil of said responder means are arranged in parallel to each other, and said responder means comprises a frequency divider connected between said receiving coil and said transmitting coil and arranged to divide the signal frequency received by a factor of $N \geqq 4$.



4,551,713
PET DOOR MAT ALARM

Joseph W. Aossey, 2245 Birchwood Dr., N.E., Cedar Rapids, Iowa 52402

Filed Jan. 28, 1983, Ser. No. 461,936
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—666 3 Claims

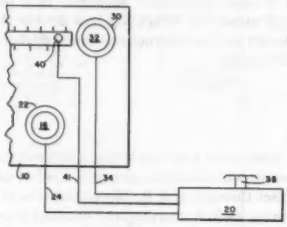


1. A floor mat indicator for indicating a mat depressing weight thereon such as an animal passing thereover comprising: first and second electrical conductive means connectable to an electric circuit; resiliently deflectable structural means normally holding said first and second conductive means apart yet resiliently deflectable by pressure to permit said first and second conductive means to come into electrical conductive contact one with the other; and an electrical non-conductive enclosure enclosing said first and second conductive means, and said resiliently defectable stuctural means; wherein said first and second electrical conductive means are first and second conductive material sheets having electrical connections respectively to first and second electrical line leads extended through said electrical non-conductive enclosure from the interior to the exterior thereof; said resiliently deflectable structural means normally holding said first and second means apart is two planar sheets of electrically insulative plastic that alone hold said first and second electrical conductive material sheets apart yet permit electrical conductive contact between said conductive material sheets when sufficiently resiliently deflected as by an animal walking across said floor mat indicator; with said first and second electrical conductive material sheets positioned to the outside of said two planar sheets of plastic; with said two planar sheets of plastic joined together around their peripheral edges; and wherein openings are provided in said two planar sheets of electrically insulative plastic to permit electrically conductive contact between said conductive material sheets when said two planar sheets of electrical insulative plastic are resiliently deflected together and said first and second conductive material sheets are brought into mutual contact at some location through the general planar extent of said first and second conductive material sheets as would be occasioned by an animal walking across the floor mat.

4,551,714
REMOTE CONTROL APPARATUS FOR AUDIO SYSTEMS

Victor P. Giammarese, 4147 N. Melvina, Chicago, Ill. 60634

Filed Mar. 31, 1983, Ser. No. 480,892
Int. Cl.[4] H04Q *9/00*; H04B *1/06*
U.S. Cl. 340—825.72 3 Claims



1. A remote control device for controlling an audio entertainment system, and the like, comprising:

a transmitter unit for sending out signal waves;

a receiver unit for accepting the signal waves from said transmitter unit;

motor means operatively connected to said receiver unit, said motor means controlling the functions of the audio system to which it is attached;

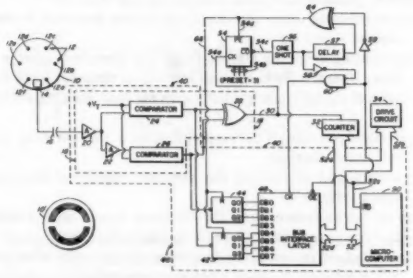
photosensing means for detecting specific settings of the tuner of the audio system mounted adjacent to the stereo indicator light of the audio system, and operatively connected to said motor means such that said motor means will stop the tuner upon reception of a signal from said photosensing means; and

transistor switch means operatively connected between said photosensing means and said motor means for disconnecting said motor means upon reception of the signal constituting a negative bias from said photosensing means.

4,551,715
TACHOMETER AND ROTOR IDENTIFICATION APPARATUS FOR CENTRIFUGES

Dennis Durbin, Eugene, Oreg., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 30, 1984, Ser. No. 605,365
Int. Cl.[4] G01P *3/481*
U.S. Cl. 340—671 29 Claims



1. An apparatus for determining the actual speed and the maximum safe speed of a centrifuge rotor, comprising:

(a) a plurality of coding elements of first and second types

attached to the rotor, the number of coding elements of each type defining a code which indicates the maximum safe speed of the rotor,

(b) a detector responsive to said coding elements for generating an output signal that varies in accordance with the number and type of said coding elements,

(c) first signal processing means responsive to the number of coding elements for generating a signal indicative of the actual speed of the rotor, and

(d) second signal processing means responsive to the types of the coding elements for generating a signal indicative of the maximum safe speed of the rotor.

4,551,716

DISPLAY CONTROL FOR ELECTRONIC CALCULATOR

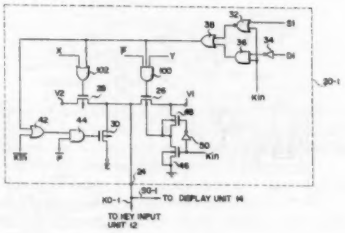
Tomotaka Saito, Yokohama, and Kenichi Nagao, Ayase, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1982, Ser. No. 390,046

Claims priority, application Japan, Jun. 30, 1981, 56-101587

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—711 **4 Claims**



1. An electronic calculator comprising:

display means including voltage-controlled capacitive display elements for a plurality of digits;

key-in means including a plurality of key switches connected in matrix fashion to a plurality of column lines and row lines;

calculation control means having a set of output terminals connected both to said display means and said key-in means, said calculation control means including means for supplying detection signals to said key-in means for determining the closure state of said key switches and for supplying segment signals for operating said display means, the output terminals of said set operating simultaneously during a display period to supply said detection and segment signals; and

said calculation control means including a voltage dividing circuit producing a plurality of voltage levels at a plurality of voltage supply points, a plurality of switching means for coupling said voltage levels to said output terminals to supply said detection and segment signals, and means for controlling said switching means to prevent said set of output terminals from being coupled through said switching means to more than one of said voltage supply points for any substantial length of time during said display period.

4,551,717

INTELLIGENT KEY DISPLAY

Carl T. Dreher, Dallas, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Nov. 10, 1982, Ser. No. 440,778

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—712 **5 Claims**

1. A programmable key for use on a keyboard having a keyselect switch wherein the key has a display visible in the top thereof, including:

a key cap and a key body;

said key cap having a transparent top;

at least one display device mounted in said key cap and visible through said transparent top;

a microcircuit interconnected with the keyselect switch and said display device for providing programmable control of said display device by means of the keyboard when the keyselect switch is placed in the key programming mode;

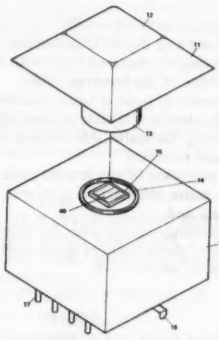
said microcircuit including:

a state controller;

a buffer;

a clock;

a multiplexer and a driver;



said state controller providing logical control to advance data input into said microcircuit through said buffer and said driver to said display device;

said clock providing timing signals for said state controller and said multiplexer; and

said multiplexer providing enable signals to turn said display device on to display the characters indicative of the data input to said microcircuit; and

said key cap mounted in a moveable relationship with said key body so that upon depression of said key cap a switching function is accomplished.

4,551,718

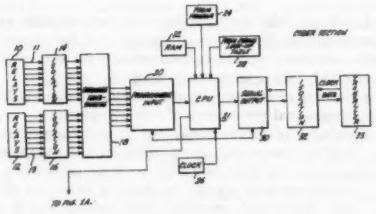
METHOD AND APPARATUS FOR TRANSMITTING STATUS INFORMATION BETWEEN REMOTE LOCATIONS

John A. Cookson, Bozeman; Richard L. Schatzka, Butte; Richard A. Echard, Butte, and Gary W. Scheer, Butte, all of Mont., assignors to Tetragenics, Inc., Butte, Mont.

Filed Jun. 24, 1983, Ser. No. 507,560

Int. Cl.⁴ H04Q *9/00*; G06F *15/20*; H04L *11/16*

U.S. Cl. 340—825.16 **19 Claims**



1. A method of transmitting status information from a first location to a remote second location comprising the steps of:

At the first location:

(a) monitoring the state of a plurality of devices, each of which is in either an active or inactive state;

(b) assembling a table of digital codes such that a distinct

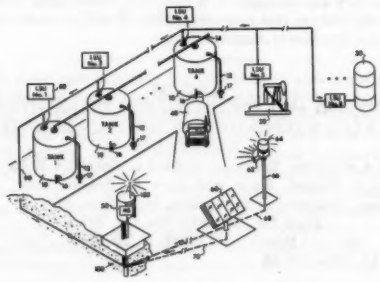
code is associated with each possible state of each said device;
(c) determining the current state of each device and assigning the proper digital code for each device in its current state;
(d) determining if any device has changed from the inactive to the active state;
(e) transmitting in a predetermined sequence the codes for each device;
(f) if a change to the active state has occurred for any device, interrupting said predetermined sequence, to transmit the digital code associated with the device that has changed state;
At the second location:
(g) receiving said digital codes in the order transmitted;
(h) comparing the received code with the table to determine the validity of the received code;
(i) if the received code is valid, decoding the code to determine the device and state represented;
(j) outputting the status information based on the most recent code received;
(k) upon reception of any invalid code, inhibiting output so that no status information is output until validity is reestablished; and
(l) reestablishing validity after the reception of a valid code for each of the monitored devices without reception of an intervening invalid code.

4,551,719

OIL FIELD LEASE MANAGEMENT AND SECURITY SYSTEM AND METHOD THEREFOR

John A. Carlin, Aspen; William G. Mesch, Denver; William L. Mobeck, Denver; Randall D. Thompson, Denver; Jules B. Henthorn, Aurora, and Benjamin L. Lopez, Westminster, all of Colo., assignors to Cypher Systems, Denver, Colo.

Filed Mar. 7, 1983, Ser. No. 472,651
Int. Cl.⁴ H04Q *9/00*
U.S. Cl. 340—825.36 **28 Claims**



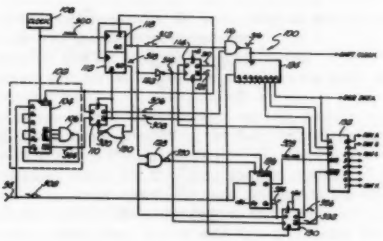
1. An oil field lease management and security system for monitoring oil field lease equipment and for communicating with authorized operators interacting with said oil field lease equipment, said system comprising:
a plurality of means connected to said equipment for sensing operational parameters of said equipment,
a plurality of means connected to said equipment for controlling operational components of said equipment,
means separate from said equipment for converting operator communication signals originating from and directed to said authorized operators into corresponding electrical signals,
an alarm, and
means connected to said converting means and interconnected with said sensing means and with said controlling means for periodically monitoring each of said sensing means and said converting means, said monitoring means being capable of storing equipment information corresponding to said operational parameters and operator information from said converting means and of selectively activating said controlling means based on said equipment and operator information, said monitoring means being further responsive to said operator information for determining whether said operator's interaction with said equipment is authorized, said monitoring means being capable of generating and storing equipment information concerning said operators' interaction, if said operators' interaction is unauthorized with said equipment, said monitoring means being further connected to said alarm for activating said alarm, said converting means being capable of converting said equipment and operator information stored in said monitoring means into operator usable data.

4,551,720

PACKET SWITCHING SYSTEM

Michael M. Levin, Agoura Hills, Calif., assignor to Cybernetic Data Products, Chatsworth, Calif.

Filed Mar. 25, 1983, Ser. No. 478,970
Int. Cl.⁴ H04Q *9/00*; **H04J** *3/12*
U.S. Cl. 340—825.52 **17 Claims**



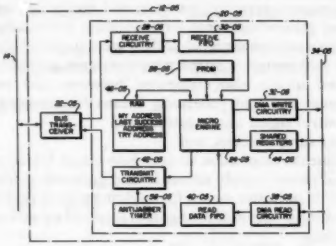
1. A real time packet switching system for serially transmitting a matrix of data bytes along a transmission means, the matrix having at least one matrix dimension, comprising:
an encoding means comprising:
means for selecting a set of data bytes having one common matrix dimension, each data byte having a plurality of data bits; parallel outputting the data bits of one sequentially selected data byte in said set during each of a plurality of time intervals; generating at least one address byte identifying the common dimension and consecutive shifting each of the at least one address byte after all of the data bytes have been sequentially shifted, the set of data bytes and the identifying address bytes defining a word packet; and generating a steering signal indicative of whether the address byte is the last to occur address byte in the word packet;
latch register means for receiving one of the data/address bytes and the steering signal during one of the time intervals and forming a word which comprises a data word when the word includes an address byte, and a steering bit set to correspond to the steering signal valve, and
means for serially shifting the formed word from the latch register means to the transmission means at a predefined bit rate during the time period between the predefined intervals and serially transmitting the word along the transmission means at the bit rate; and
decoding means comprising:
means for detecting the start of each word appearing on the transmission means,
register means having a number of storage locations equivalent to the sum of all the bits in the address bytes,
means for enabling bit-by-bit serial shifting of just the data and address bytes of the formed word into the register means,

means for sensing the level of the steering bit and using the data in the shift register to generate an address command when the steering bit is at a first level indicating that the data in the shift register comprises the at least one address byte.

4,551,721
METHOD FOR INITIALIZING A TOKEN-PASSING LOCAL-AREA NETWORK

Tony J. Kozlik, Phoenix, Ariz., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Oct. 7, 1983, Ser. No. 540,216
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.52 **7 Claims**



1. The method of initializing a token-passing local-area network which includes a plurality of modules communicating with one another over a common bus, with each module having a unique network address, comprising the steps of:

(1) each module listening for a predetermined period of time for any transmissions of signals on the bus;

(2) transmitting, if no signals are heard during step 1, for a period of time which is a function of each module's address;

(3) listening after a fixed delay for a fixed period of time after terminating transmission under step 2;

(4) the module that hears nothing in step 3, transmitting tokens sequentially addressed to each network address until a token is accepted by an addressed module; and

(5) the module performing step 4 producing a fault signal and terminating initializaton if the network address of a token to be transmitted in step 4 is that of the module performing step 4.

4,551,722
APPARATUS AND METHOD FOR DETECTING OBSTACLES IN THE PATH OF A MOVING VEHICLE

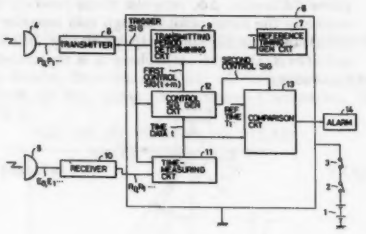
Tadashi Tsuda, Nagoya; Seiichiro Hiramatsu, Oobu; Mitsugi Ohtsuka, and Tsuyoshi Maeno, both of Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 15, 1983, Ser. No. 475,626
Claims priority, application Japan, Mar. 16, 1982, 57-41917
Int. Cl.[4] G08G *1/00*; G01S *13/00, 15/93*
U.S. Cl. 340—904 **10 Claims**

1. Apparatus for detecting obstacles in the path of a vehicle, comprising:

(a) an ultrasonic radar system for periodically transmitting ultrasonic wave pulses and receiving echo signals reflected at obstacles;

(b) driving-detecting means for measuring time between the instance of transmission of the ultrasonic wave pulse and the instance of reception of its echo signal for detecting the distance between said vehicle and an obstacle, and for causing said ultrasonic radar system to transmit ultrasonic wave pulses at an interval variable in accordance with the distance-indicating time, said driving-detecting means having a computing means arranged to check whether the distance-indicating time has a predetermined relationship with a reference time so as to produce an output detection signal when a detected obstacle is within a dangerous range, said computing means checking said distance-indicating time at every other transmitting period; and

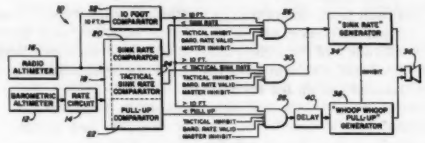


(c) an alarming device responsive to the result of said comparison for alerting the vehicle driver.

4,551,723
EXCESSIVE DESCENT RATE WARNING SYSTEM FOR ROTARY WING AIRCRAFT

Noel S. Paterson, Bothell, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jun. 10, 1983, Ser. No. 503,218
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—946 **18 Claims**



1. A warning system for rotary wing aircraft of the type capable of autorotation, comprising:

means for receiving signals representative of the altitude of the aircraft above the ground and the descent rate of the aircraft; and

means responsive to said receiving means for generating a warning if the relationship between the altitude and descent rate of the aircraft approaches the point where the aircraft cannot be landed safely by autorotation.

4,551,724
METHOD AND APPARATUS FOR CONTOUR MAPPING USING SYNTHETIC APERTURE RADAR

Richard M. Goldstein, La Canada; Edward R. Caro, Monterey Park, and Chialin Wu, Pasadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

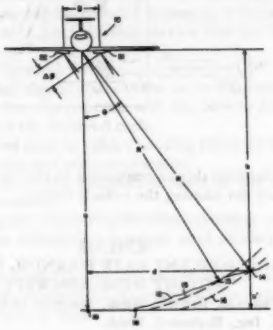
Filed Feb. 10, 1983, Ser. No. 465,365
Int. Cl.[4] G01S *13/90*
U.S. Cl. 343—5 CM **10 Claims**

6. A method for determining the elevation of terrain features in synthetic aperture radar image data using two antennae spaced apart a fixed distance, B, on a platform which carries the radar over terrain, where the distance B is measured in a horizontal plane while the platform is in level flight, comprising the step of

separately processing the return signals from said antennae in complex vector form to the pixel level, and recording for each pixel from each antennae the altitude, a, of the radar platform above a fixed reference together with the roll angle, α, of the platform,

determining the slant range, R, of pixels from the return signals received through said two antennae from substantially the same point of said terrain,

from said pixel data in complex vector form, determining the phase difference, $\Delta\phi$, between pixels received from substantially the same point through said separate antennae from the relationship expressed by the equation $\Delta\phi=(2\pi B/\lambda)\sin(\theta-\alpha)$ where λ is the wavelength of said radar,



determining the vertical height, h, of said platform above each pixel from the slant range as a function of the cosine of the slant angle R for each pixel, and

for each pixel, determining elevation, a', with respect to said fixed reference as the difference between said known altitude a of the radar platform and the determined height h of said platform with respect to a corresponding point on said terrain for each pixel.

4,551,725

SYSTEM FOR IDENTIFICATION AND DETERMINATION OF THE MOMENT OF PASSAGE OF A MULTIPLE NUMBER OF MOVING BODIES AT A GIVEN POINT ON THEIR PATH

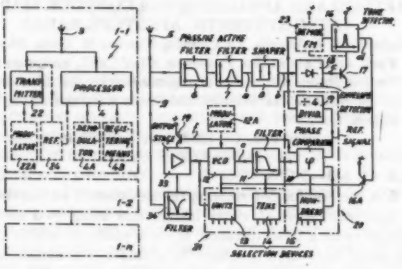
Rudolf Schaffer, La Chaux-de-Fonds, Switzerland, assignor to Compagnie des Montres Longines Francillon S.A., Switzerland

Filed Sep. 3, 1982, Ser. No. 414,913

Claims priority, application Switzerland, Sep. 7, 1981, 5751/81

Int. Cl.⁴ G01S *13/78*

U.S. Cl. 343—6.5 SS **18 Claims**



1. A system for identification and determination of the moment of passage of a multiple number of moving bodies over a given line intersecting their path, comprising in combination:

a plurality of mobile devices mounted respectively on said moving bodies, each of said mobile devices comprising transmitter means capable of transmitting a respective radio identification signal at a frequency which is representative of said moving body;

a fixed receiving antenna set up on said line and to receive the respective identification signals;

means for processing the identification signals received by the receiving antenna to identify each respective moving body which emitted it and the time each respective body passes by said receiving antenna;

a fixed transmitter located in proximity to said given line for emitting a control signal controlling the transmitters of said mobile devices;

each of said mobile devices further comprising

means for receiving said control signal,

means for generating said identification signal at said representative frequency,

first means connected between said receiving means and said generating means for converting said control signal into a reference signal with respect to which the value of said representative frequency signal is established,

second means also connected between said receiving means and said generating means for converting said control signal into a gate signal,

power supply means, and

gate means responsive to said gate signal for connecting said power supply means to said generating means and said transmitter means for applying power thereto only as long as said control signal is received by said receiver means.

4,551,726

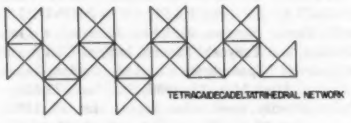
OMNI-DIRECTIONAL RADAR AND ELECTRO-OPTICAL MULTIPLE CORNER RETRO REFLECTORS

Richard M. Berg, Rte. 2, Box 2507, Stafford, Va. 22554

Filed Jul. 30, 1982, Ser. No. 403,682

Int. Cl.⁴ H01Q *15/18*

U.S. Cl. 343—18 C **27 Claims**



18. A planar two dimensional unitary network or pattern constituting an intermediate product adaptable by preselected design for assembling different members of a family of orthogonal polydeltatrihedral corner reflectors, each of said networks being formed on at least a semi-rigid reflective surfaced sheet material capable of being self-supporting when in the folded and assembled condition, each network comprising:

(a) a plurality of orthogonally arranged parallel horizontal rows and vertical columns of deltatrihedral-forming subpatterns of which each subpattern is constituted by three delineated uniform size adjoining 45° right constituent triangles;

(b) said right triangles oriented to have a common vertex formed by the mutual coincidence of individual apexes of each triangle, and further such that the 45° sides of the

respective triangles collectively form a 90° "X" figure, with the respective three hypotenuses disposed at 90° relative to one another, some of which are vertically oriented and other of which are horizontally oriented;

(c) said rows of said subpatterns terminating in oppositely disposed parallel vertical free edges;

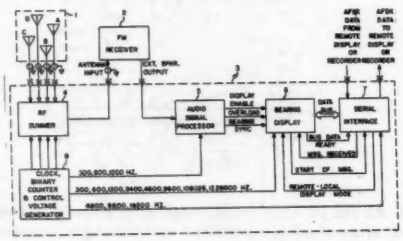
(d) said columns of said subpatterns terminating in top and bottom free edges substantially all of which have 90° "V" shapes; and

(e) all non-free edges of said delineated triangles including means facilitating folding or hinged interconnection between all interconnected triangles and subpatterns.

4,551,727
RADIO DIRECTION FINDING SYSTEM

David C. Cunningham, 5540 E. Charter Oak, Scottsdale, Ariz. 85254

Continuation-in-part of Ser. No. 157,366, Jun. 9, 1980,. This application Dec. 23, 1982, Ser. No. 452,712
Int. Cl.⁴ G01S *3/54*
U.S. Cl. 343—418 **15 Claims**



1. A radio direction finding system for determining the bearing of a source of an rf signal comprising:

an array of "n" nondirectional antennas substantially located at the vertices of a regular polygon of "n" sides and positioned substantially perpendicular to the plane of the polygon, where "n" is an integer having values in the range of from 3 to 8, the length of each side of the polygon being in the range of from one eighth to three eighths the wavelength of the rf signals of the source;

"n" electronically controlled variable gain means, the gain of each of which is a continuous function of a control signal applied thereto, each such variable gain means having a substantially constant input impedance and producing an output signal which is a function of an input signal applied thereto and the control signal;

"n" transmission line means each connecting an antenna to a variable gain means for applying antenna signals induced in the antenna to which each transmission line is connected to one of said variable gain means as the input signal thereto, each transmission line presenting to the antenna to which it is connected a characteristic impedance substantially matched to the input impedance of the variable gain means to which it applied signals;

circuit means for summing the output signals of each of the variable gain means to produce a summed output signal;

control signal means for producing "n" control signals for varying the gains of the variable gain means so that the summed output signal approximates the signals induced in a single antenna rotating in a circular path at a rotational frequency corresponding to a doppler modulation frequency f(d) in the audio range;

circuit means for applying a control signal produced by the control signal means to each of the variable gain means;

receiver means to which the summed output signal is applied for detecting the doppler modulation frequency of the summed output signal;

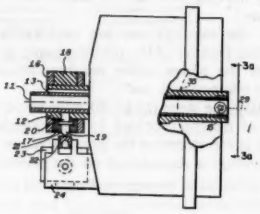
means for measuring the phase angle of the doppler modulation frequency with respect to one of the control signals for generating a bearing signal which is a function of said phase angle; and

means for displaying the bearing signal.

4,551,728
APPARATUS FOR RAPID SWITCH CONICAL SCAN FEED

Robert S. Roeder, Dunedin, and Peter M. Sterghos, St. Petersburg, both of Fla., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,423
Int. Cl.⁴ H01Q *3/18*
U.S. Cl. 343—761 **5 Claims**



1. An apparatus for rapidly starting and stopping a conical scan antenna beam comprising:

feed means having a centerline and first and second ends for directing electromagnetic energy, said feed means includes a hollow circular cylinder,

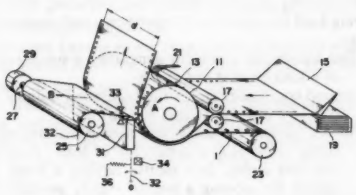
cylindrical rotating means having first and second ends and a hollow inner region for rotating said feed means about a line coincident with said centerline, said hollow inner region being circular at said first end of said rotating means and elliptical at said second end of said rotating means, said feed means inserted in said hollow inner region with said first end of said feed means pivotally mounted at said first end of said hollow inner region, and

means for displacing said feed means a predetermined distance at said second end from said coincident line.

4,551,729
METHOD OF MAKING THERMAL TRANSFER TYPE MULTICOLOR PRINTING

Takeshi Kubo, Tokyo; Junji Kawano, Ise; Fumio Takahashi, Ise, and Tsutomu Yamaguchi, Ise, all of Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,630
Claims priority, application Japan, Jul. 9, 1982, 57-119241
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—1.1 **4 Claims**



1. A method for making a thermal transfer type multicolor printing, comprising the steps of:

(a) setting an ink ribbon over a platen roller with a sheet of printing paper being interposed therebetween, the ink ribbon having at predetermined intervals a plurality of ink zones each carrying one of heat-dissolving inks of different colors;

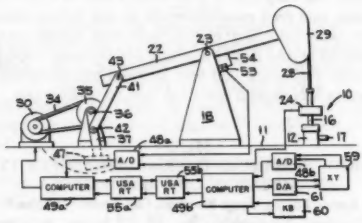
(b) then, positioning one of the ink zones at a printing position on the platen roller, the one ink zone being of a predetermined color;
(c) placing a thermal head at the printing position against the positioned one ink zones;
(d) driving the thermal head for transferring the ink of the one ink zone to the printing paper so that a first dot line of one picture component, for the predetermined color, of a picture to be printed is reproducted by the use of ink of the one ink zone;
(e) after the step (d), advancing the printing paper and the ink ribbon for a subsequent printing of the picture component;
(f) repeating the steps (d) and (e) until the whole picture component for the predetermined color is reproduced on the printing paper;
(g) then, moving the thermal head away from the printing position;
(h) after the step (g), moving backwards a predetermined restarting portion of the printing paper to the printing position on the platen roller for reproducing the remaining picture components; and
(i) repeating the steps (b) to (h) with respect to the other ink zones of different colors for reproducing the remaining picture components on the printing paper, whereby a multicolor picture is reproduced on the printing paper.

4,551,730

METHOD AND APPARATUS FOR ENTERING CONTROL POINTS RELATIVE TO A DYNAGRAPH OF A WELL PUMPING UNIT

Louis S. McTamaney, Cupertino, Calif.; Gary W. Bisbee, The Woodlands, Tex.; Robert W. Kettlety, and James L. Konsevich, both of San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 18, 1983, Ser. No. 470,017
Int. Cl.[4] G01D *9/00*; E21B *47/00*
U.S. Cl. 346—33 WL **3 Claims**



1. Apparatus for entering control points relative to a dynagraph of a well pumping unit having a deep well pump connected to a sucker-rod string, a power unit to reciprocate said rod string to produce fluid from an underground location and a computing means for monitoring rod string position and rod string load to analyze well conditions, said apparatus comprising:

first transducer means for generating a signal representative of a load on said rod string;

second transducer means for generating a signal representative of a position of said rod string;

an XY plotter for using said load signal and said position signal to develop a dynagraph of load versus position of said rod string, said plotter having a beam and a pen holder for moving a pen to visibly produce said dynagraph;

means for using a signal proportional to the position of said beam and a signal proportional to the position of said pen holder to select a control point relative to said dynagraph; and

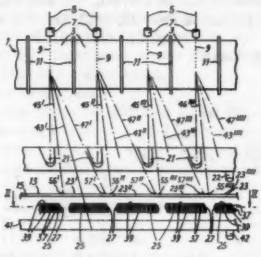
means for entering said selected control point into said computing means for causing said pumping unit to be shut down when said dynagraph reaches a predetermined relationship to said selected control point.

4,551,731

INK JET PRINTING APPARATUS CORRECTIONAL IN DROP PLACEMENT ERRORS

John D. Lewis, Cambridge; Michael R. Keeling, Willingham; David R. Bowen, Bar Hill, and Anthony D. Paton, Long Stanton, all of England, assignors to Cambridge Consultants Limited, Cambridge, England

Continuation of Ser. No. 246,221, Mar. 23, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,169
Claims priority, application United Kingdom, Mar. 26, 1980, 8010105
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **11 Claims**



1. An ink jet array printer adapted to print by depositing small drops of ink in accordance with printing information on a surface to be printed during unidirectional movement relatively to the printer, of the printing surface, comprising one or more rectilinear rows of ink jet printing guns, each gun having (a) means for supplying printing ink under pressure to an orifice, (b) means for forming regularly spaced drops in the ink stream issuing from the orifice, (c) charge electrode means for imparting charge levels to drops in the stream, (d) means for applying to the charge electrode means, under the control of the printing information, a periodic voltage waveform whose period is sufficient to span the formation of a series, hereinafter referred to as a "raster", of consecutively formed drops and whose amplitude is dependent on said printing information and determines said charge levels imparted to drops in the ink stream, (e) drop deflection means for providing a substantially constant electrostatic field through which the drops pass towards the printing surface and for causing deflection of electrically charged drops, transversely to the direction of relative movement of the printing surface and the printer, to an extent dependent upon the charge levels on the drops, and (f) drop intercepting means for collecting drops other than those drops charged for printing on the printing surface, the drops charged for printing in the printing guns during each period of the voltage waveform being deposited in respective line sections formed by contiguous drops, which sections together present a printed line transversely of the direction of relative movement, the printed lines being formed in contiguity successively at the frequency of the voltage waveform applied to the charge electrode means, the improvement whereby nozzle-associated drop placement errors in the direction of relative movement of the printing surface and the printer are corrected, wherein the printer further includes:

a plurality of detector means, one said detector means associated with each printing gun, for electrically sensing the position of jets of charged test drops from said associated printing gun, thereby to provide values representative of drop placement errors in the direction of relative motion of the printing surface and the printer of drops printed by said associated printing gun, and

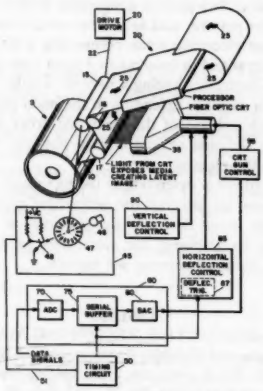
controls means responsive to said values provided by said detector means of each printing gun for advancing or retarding, in dependence upon said values, the application to the charge electrode means of the corresponding printing gun of the periodic voltage waveform, thereby to correct for drop placement errors in the direction of relative movement of the printing surface and the printer, as measured by the positions of the jets of charged test drops sensed by the detector means.

4,551,732

METHOD AND APPARATUS FOR MODULATING THE RECORDING RATE OF AN IMAGE ON THE RECORDING MEDIA OF A LINE SCAN GRAPHIC RECORDER WITH THE VELOCITY OF THE RECORDING MEDIA

Jerrold J. Rogers, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 20, 1983, Ser. No. 505,680
Int. Cl.[4] G01D *9/00, 9/42*
U.S. Cl. 346—110 R **6 Claims**



1. A method of modulating the recording rate of an image on a recording media, as the media passes a fixed position single line writing means, with the instantaneous velocity of the recording media in a line scan recorder, the method comprising the steps of:

a. generating a signal having characteristics that are directly proportional to instantaneous variations in the velocity of the recording media;

b. sequentially storing each line of input data; and

c. triggering the sequential release of each line of data stored in step b in response to the signal of step a.

4,551,733

PROTECTED OPTICAL DISC COMPRISING A FLEXIBLE CLOSURE ELEMENT

Jean Cornet; Francois Langé ; Francois Le Carvennec; Jean-Claude Lehureau, and Roger Rascle, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Mar. 11, 1983, Ser. No. 474,452
Claims priority, application France, Mar. 23, 1982, 82 04913
Int. Cl.[4] G01D *15/32*
U.S. Cl. 346—137 **8 Claims**

1. An optical disc and disc-drive device for use with an optical beam apparatus comprising:

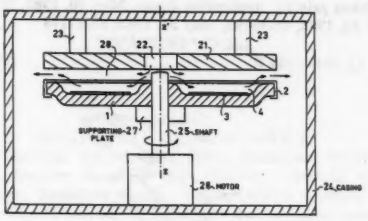
a drive motor with a drive shaft;

a supporting element having a center hole for receiving said drive shaft, and having two annular raised portions of said element, one of which is concentric and adjacent to said center hole and the other of which is concentric and adjacent the periphery of said element, and having an annular depressed portion between said raised portions;

means defining an annular recording surface deposited on said supporting element in said depressed portion;

a protective flexible layer permeable to optical beams from said optical beam apparatus, and supported on raised portions of said element so as to form an annular chamber between said element and said layer, said recording surface being contained therein;

stationary disc cover means mounted parallel to said supporting element having a hole coaxial with but larger than said drive shaft and having portions permeable to said optical beams; and



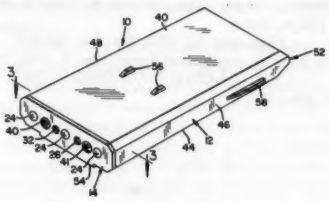
a gas chamber defined by a space betwen said disc cover and said flexible layer so that rotation of said disc causes centrifugal force on gas in said gas chamber to push the same radially outward away from said coaxial hole and thereby draw gas through said coaxial hole into said gas chamber, wherein negative pressure thereby created in said gas chamber draws said flexible layer upward to prevent the flexible layer from contacting said recording surface.

4,551,734

INK CARTRIDGE WITH INK LEVEL SENSOR

Gary C. Causley, Portland, and Martin D. Rosback, West Linn, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 6, 1984, Ser. No. 679,199
Int. Cl.[4] G01D *15/18;* **B65D** *37/00;* **G01F** *23/26;* **E41F** *33/12*
U.S. Cl. 346—140 R **11 Claims**



1. An ink cartridge comprising:

an ink container having an ink flow opening through which ink is delivered from the ink container, the ink container collapsing as ink is used from the container;

electrical probe support means projecting into the interior of the ink container, said electrical probe support means including a first flat ink container closure surface against which the ink container collapses as ink is used from the container;

first and second spaced apart electrical probes extending into the ink container, a portion of each of the probes being exposed to the ink within the ink container with the flat ink container closure surface extending between the exposed probe portions, thereby providing a first electrically conductive path between the exposed probe portions and through the ink along the first ink container closure sur-

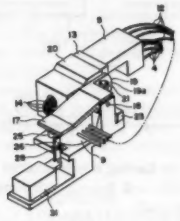
face, the conductive path being closed as ink is used from the ink container and the ink container collapses against the first container closure surface.

4,551,735

INK JET RECORDING APPARATUS

Tetsuo Suzuki, Yokohama, and Shigemitsu Tazaki, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1984, Ser. No. 612,698
Claims priority, application Japan, May 30, 1983, 58-96492; May 30, 1983, 58-96493; May 31, 1983, 58-97278
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **13 Claims**



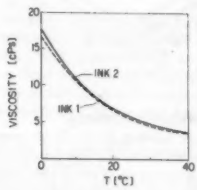
1. An ink jet recording apparatus comprising:
recording means for discharging ink in response to a recording signal;
cap means for covering the ink discharging portion of said recording means;
attracting means for attracting said recording means covered by said cap means; and
means for inhibiting said cap means from being released from a condition in which it covers said recording means, for a predetermined time after said attracting means has been operated.

4,551,736

INK-JET RECORDING METHOD

Eiichi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,268
Claims priority, application Japan, Sep. 9, 1983, 58-165119
Int. Cl.[4] G01D *15/18*; C09D *11/00*
U.S. Cl. 346—140 R **8 Claims**



1. An ink-jet recording method employing inks of at least one color and a plurality of inks containing different concentration of a dye for each color, characterized in that the viscosities of the plurality of inks of the same color in the temperature range of 0° to 40° C. satisfy the relation

$$V_{max.} - V_{min.} \leqq 1.0 \text{ (cps)}$$

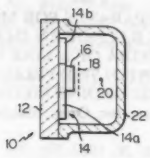
wherein, $V_{max.}$ and $V_{min.}$ represent the maximum and minimum values, respectively, of the viscosities.

4,551,737

OPTICAL DATA PATTERN GENERATION DEVICE COMPRISING PHOSPHOR MEMBER

Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,760
Claims priority, application Japan, Jun. 21, 1982, 57-106595; Jun. 21, 1982, 57-106596
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—161 **16 Claims**



1. An optical data pattern generation device for generating an optical dot pattern, said apparatus comprising:
at least one electrode array comprising a plurality of electrodes arranged in an array in a main scan direction, each of said electrodes having a narrow width;
a phosphor member extending in the main scan direction in the neighborhood of the electrode array, said phosphor member defining optical dots in portions thereof which overlap the electrode array;
a cathode filament extending in the main scan direction; and
drive means for driving the individual electrodes of the electrode array to cause the portions of the phosphor member overlapping the electrodes to emit light and thereby form a luminous dot pattern.

4,551,738

THERMOSENSITIVE RECORDING MATERIAL

Keiichi Maruta, and Yukihiro Yuyama, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 352,605, Feb. 24, 1982, Pat. No. 4,444,819. This application Feb. 17, 1984, Ser. No. 581,106
Claims priority, application Japan, Mar. 5, 1981, 56-31457
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—200 **15 Claims**

1. A thermosensitive recording material comprising, in successive layers:
a support material;
a thermosensitive coloring layer formed on the front side of said support material, said thermosensitive coloring layer comprising a leuco dye and an acidic material, said acidic material being capable of causing said leuco dye to become colored when heat is applied thereto; and
a protective layer formed on the front side of said thermosensitive coloring layer, said protective layer comprising polyvinyl alcohol having a saponification ratio in the range of from 70% to 85%.

4,551,739

RECORD MEMBER

Robert E. Miller, and Steven L. Vervacke, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed May 23, 1984, Ser. No. 612,957
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 346—216 **10 Claims**

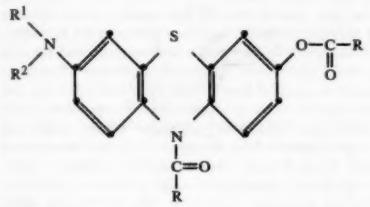
1. A record member comprising a substrate and a developer composition comprising 2,2-bis(4-hydroxyphenyl)-5-methylhexane.

4,551,740
ELECTROCHROMIC AND MARKING SYSTEMS

William M. Hung, Cincinnati, Ohio, assignor to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Jul. 31, 1984, Ser. No. 636,464
Int. Cl.[4] B41M 5/20
U.S. Cl. 346—218 6 Claims

1. A substrate for use in electrochromic recording comprising a support sheet containing as a color-forming substance a 3-(R-carbonyloxy)-7-[N-(R^1)(R^2)-amino]-10-(R-CO)-phenothiazine having the formula



wherein:

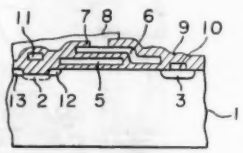
R represents non-tertiary C_1 to C_{12} alkyl, C_4 to C_8 cycloalkyl, non-tertiary C_1 to C_{12} alkyl substituted with halogen, non-tertiary C_1 to C_4 alkoxy or non-tertiary C_1 to C_4 alkoxycarbonyl, phenyl or phenyl substituted by one to three of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro, halo, phenyl or cyano; and

R^1 and R^2 independently represent C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy.

4,551,741
DRAM WITH POLYSI BIT LINES AND ADDED JUNCTION CAPACITANCE

Kazuhiro Shimotori, and Hideyuki Ozaki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 279,559, Jul. 1, 1981, abandoned. This application Dec. 29, 1983, Ser. No. 565,531
Claims priority, application Japan, Jul. 7, 1980, 55-93461
Int. Cl.[4] H01L 27/04; G11C 11/40
U.S. Cl. 357—23.6 3 Claims



1. In a semiconductor memory device having at least two layers of polycrystalline silicon and having an insulated gate field effect transistor as a fundamental element formed on a substrate, an improvement comprising:

a first layer of polycrystalline silicon serving as an electrode of a capacitor including an electric charge storage region, and a bit line, said first polycrystalline silicon layer extending over only a portion of said electric charge storage region, said electric charge storage region including a region not covered by said first polycrystalline layer, said not covered region formed in said substrate and having a conductivity type opposite that of said substrate and acting as an additive junction capacitor to increase the charge storage capacity of said charge storage region; and

a second layer of polycrystalline silicon serving as a gate electrode of said transistor,

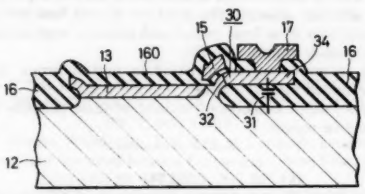
said second layer of polycrystalline silicon partially covering said first layer of polycrystalline silicon and also not covering said additive junction capacitor; and

said first and second polycrystalline silicon layers extending over and covering regions of said substrate which are all only of the substrate conductivity type.

4,551,742
SOLID-STATE IMAGING DEVICE

Iwao Takemoto, Tokyo; Shiya Ohba, Kanagawa; Masakazu Aoki, Kodaira; Haruhisa Ando, Hachioji; Masaaki Nakai, Kodaira; Toshifumi Ozaki, Tokyo; Masao Tamura, and Masanobu Miyao, both of Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 328,621, Dec. 8, 1981,. This application Aug. 14, 1984, Ser. No. 640,570
Claims priority, application Japan, Dec. 8, 1980, 55-184784[U]
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—31 13 Claims



1. A solid-state imaging device comprising:

a substrate;

a plurality of photoelectric conversion elements formed on said substrate;

a plurality of switching means formed on said substrate, said switching means each being coupled to a respective photoelectric conversion element to form a plurality of picture element pairs in said substrate, each of said picture element pairs comprising a photoelectric conversion element and a switching means, said picture element pairs being arranged in an array in said substrate, wherein each of said switching means is formed of a plurality of semiconductor regions including a first region for receiving a signal from said photoelectric conversion element, a second region for providing an indication of a state of said photoelectric conversion element signal received at said first region, and a third region coupled between said first and second regions to control the transfer of said indication of said state of said photoelectric conversion element signal from said first region to said second region; and

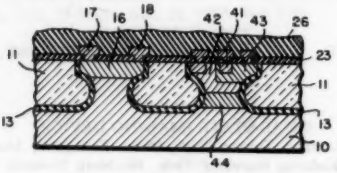
scanning means coupled to said third region for controlling the transfer of said indication of said state of said photoelectric conversion element signal from said first region to said second region,

wherein said second region is disposed on an insulating film overlaying said substrate, said insulating film having a predetermined thickness which is sufficient to prevent a flow of photoelectrons generated in said photoelectric conversion element into said second region.

4,551,743
SEMICONDUCTOR INTEGRATED CIRCUIT WITH ISOLATION REGION MADE OF DIELECTRIC MATERIAL

Kenji Murakami, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 296,476, Aug. 26, 1981, abandoned. This application Aug. 6, 1984, Ser. No. 637,707
Claims priority, application Japan, Aug. 29, 1980, 55-119294
Int. Cl.[4] H01L *21/76, 21/302, 27/04, 29/78*
U.S. Cl. 357—50 11 Claims

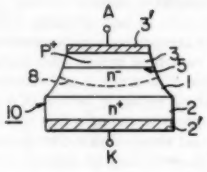


1. A semiconductor integrated circuit, comprising:
(a) a semiconductor substrate having a surface;
(b) a plurality of isolation regions formed in said substrate and filled with a dielectric material, each of said isolation regions having a first portion near said surface of said substrate with parallel side walls and a second portion below said first portion with side walls extending outwardly beyond said side walls of said first portion, the substrate adjacent the juncture of said first and second portions of at least one of said isolation regions having a constant impurity profile;
(c) an active region included in said substrate and surrounded by said isolation regions; and
(d) a circuit component formed at least partially in said active region.

4,551,744
HIGH SWITCHING SPEED SEMICONDUCTOR DEVICE CONTAINING GRADED KILLER IMPURITY

Kensuke Suzuki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,328
Claims priority, application Japan, Jul. 31, 1981, 56-119087
Int. Cl.[4] H01L *29/167, 29/74*
U.S. Cl. 357—64 6 Claims

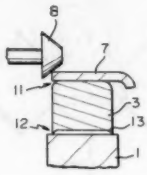


1. A semiconductor device including at least one pn junction across which a current is allowed to flow, comprising:
a first semiconductor region of a first conductivity type having a high resistivity;
a second semiconductor region of a second conductivity type opposite to said first conductivity type, having an impurity concentration higher than that of said first semiconductor region and disposed adjacent to said first semiconductor region to form one of said at least one pn junction therebetween; and
a graded distribution of lifetime killer formed in substantially the whole portion of said first semiconductor region and having a killer concentration distribution which decreases with an increase in distance from said one pn junction.

4,551,745
PACKAGE FOR SEMICONDUCTOR DEVICE

Hisashi Watanabe, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 28, 1982, Ser. No. 425,650
Claims priority, application Japan, Sep. 30, 1981, 56-153892
Int. Cl.[4] H01L *23/04;* B23K *11/34*
U.S. Cl. 357—72 3 Claims

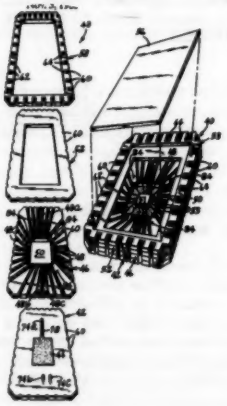


1. A package for a semiconductor device comprising: a sealing frame having first and second opposing sides, the second side having a projected edge portion comprising a flash or a burr produced by blanking presswork of said sealing frame; a package substrate fixed to said first side of said sealing frame; a semiconductor element fixed to said package substrate; and a sealing cap fixed to said second side of said sealing frame by seam welding,
wherein said semiconductor element is sealed by said sealing frame and said sealing cap, and wherein said sealing cap is welded to said sealing frame at the projected edge portion of said sealing frame.

4,551,746
LEADLESS CHIP CARRIER APPARATUS PROVIDING AN IMPROVED TRANSMISSION LINE ENVIRONMENT AND IMPROVED HEAT DISSIPATION

Barry K. Gilbert, and Daniel J. Schwab, both of Rochester, Minn., assignors to Mayo Foundation, Rochester, Minn.

Continuation-in-part of Ser. No. 432,843, Oct. 5, 1982,. This application Jun. 20, 1983, Ser. No. 505,866
Int. Cl.[4] H01L *23/14, 23/40, 23/48, 23/04*
U.S. Cl. 357—74 21 Claims



1. A carrier apparatus for mounting logic components on a mounting surface having electrical pathways such as a circuit board, comprising:

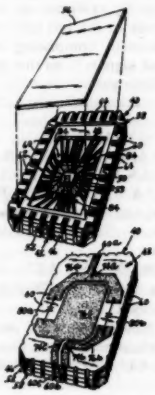
(a) a housing defining top and bottom surfaces, said housing further having a cavity for receipt of a logic component;
(b) lid means for enclosing said cavity;
(c) a plurality of electrical pathways positioned within said housing, said electrical pathways being positioned on at least two vertically spaced apart horizontal planes within said housing so as to have a "co-planar" arrangement on each of said horizontal planes, said electrical pathways further being horizontally spaced apart from one another and configured to minimize parasitic inductance and capacitance of individual electrical pathways, said electrical pathways being embedded between spaced apart planes selected from voltage and ground planes, said electrical pathways cooperating with said planes to provide a transmission line environment along said electrical pathways;
(d) vertically extending means for electrically interconnecting said electrical pathways in said housing with the electrical pathways on said mounting surface, said vertically extending means including vertically extending signal means configured to cooperate with corresponding vertically extending ground means spaced apart from said vertically extending signal means and extending substantially parallel to said vertically extending signal means, said vertically extending signal means and said vertically extending ground means cooperating to provide a transmission line like environment along said vertically extending signal means wherein said vertically extending signal means display a controlled impedance; and
(e) means for structurally attaching the carrier apparatus to said mounting surface.

4,551,747

LEADLESS CHIP CARRIER APPARATUS PROVIDING FOR A TRANSMISSION LINE ENVIRONMENT AND IMPROVED HEAT DISSIPATION

Barry K. Gilbert, and Daniel J. Schwab, both of Rochester, Minn., assignors to Mayo Foundation, Rochester, Minn.

Filed Oct. 5, 1982, Ser. No. 432,843
Int. Cl.[4] H01L *23/14, 23/40, 23/48, 23/04*
U.S. Cl. 357—74 **20 Claims**



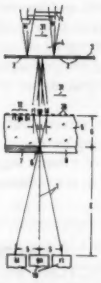
1. A carrier apparatus for mounting a logic component on a mounting surface of a circuit board, comprising:
(a) a housing including multiple layers of dielectric material, said housing having a bottom surface and a top surface facing in an opposite direction and separated from said bottom surface by the multiple layers of dielectric material, said housing having a cavity disposed in said bottom surface for receipt of a logic component, said housing having no such cavity disposed in said top surface, said cavity extending part way into said housing and defining a surface recessed within said housing for attachment of the logic component;
(b) a lid portion positioned over said cavity for hermetically sealing the logic component in said cavity;
(c) means for mounting said housing on the mounting surface of the circuit board with said bottom surface of said housing and said lid portion facing the mounting surface such that said lid portion is spaced from the mounting surface of the circuit board, said top surface facing away from the circuit board;
(d) heat dissipation means positioned proximate said top surface for dissipating heat away from the surface of the circuit board, the thickness of said top surface of said housing being minimized to facilitate heat dissiptation and yet provide structural integrity to said housing; and
(e) said housing including means for electrically interconnecting the logic component to the circuit board, said electrical interconnecting means including horizontally extending electrical leads embedded within said housing and vertically extending electrical leads electrically interconnecting said horizontally extending electrical leads to the circuit board, said horizontally extending electrical leads including horizontally spaced apart alternating ground and signal electrical leads embedded in said dielectric material of said housing between vertically spaced apart planes selected from voltage and ground planes extending parallel to said ground and signal electrical leads so as to provide a transmission line environment along said signal electrical leads, certain of said horizontally extending electrical leads being interconnected to the logic component.

4,551,748

MEASURING HEAD FOR DETERMINING THE COLOR PURITY AND THE CONVERGENCE IN A COLOR PICTURE TUBE

Hans P. Mattle, Waiblingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 16, 1983, Ser. No. 467,121
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206913
Int. Cl.[4] H04N *9/62*
U.S. Cl. 358—10 **7 Claims**



1. A measuring head for determining the convergence and the color purity of a color TV picture tube having phosphor areas arranged in the form of stripes, comprising
a diaphragm with a diaphragm aperture;
a housing for said measuring head;
a base plate carrying a plurality of sensors, including one sensor each for the colors red, green, and blue, said sensors are spaced apart from each other, the center-to-center distance between adjacent sensors being the distance S, said sensors are arranged in one line at a distance $E = G \frac{S}{L}$ from said diaphragm wherein G is the glass thickness of the front screen of said TV picture tube and L is the

center-to-center distance of adjacent ones of said stripes; and

at least one portion of said diaphragm aperture is wedge-shaped in two directions perpendicular in relation to one another.

4,551,749

CIRCUIT TO VARY THE PHASE OF THE COLOR BURST SIGNAL

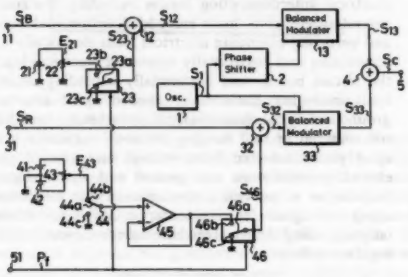
Takato Narita, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,259

Claims priority, application Japan, Jul. 30, 1982, 57-134127

Int. Cl.⁴ H04N *9/46, 9/535*

U.S. Cl. 358—28 **4 Claims**



1. A hue control circuit used for a hue corrector of a video signal processor comprising:

first adding means for adding a first DC voltage to a B−Y color difference signal during generation of a burst flag pulse;

means for selecting a second DC voltage;

second adding means for adding said second DC voltage to an R−Y color difference signal during generation of said burst flag pulse.

generating means for generating a first carrier signal and a second carrier signal with a phase difference of 90 degrees between said first and second carrier signals;

first modulating means for modulating said first carrier signal by an output signal of said first adding means;

second modulating means for modulating said second carrier signal by an output signal of said second adding means; and

mixing means for mixing output signals of said first and second modulating means;

whereby a phase of a burst signal output from said mixing means is varied in accordance with said second DC voltage.

4,551,750

COLOR PICTURE READING SYSTEM

Masami Kurata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,199

Claims priority, application Japan, Sep. 4, 1981, 56-138619

Int. Cl.⁴ H04N *1/46;* G03F *3/08*

U.S. Cl. 358—75 **6 Claims**

1. A color picture reading system, comprising:

first and second means for subjecting an optical image of an original to photo-electric conversion with respectively wide and narrow wavelength ranges;

first encoder means for binary-encoding a signal obtained from said first means with a predetermined voltage level;

second encoder means for binary-encoding an output signal from said second means with a single threshold level proportional to a level of said signal from said first means; and

circuit means for processing signals output by said first and second encoder means to perform a desired two-color separation.

4,551,751

COLOR REDUCTION DEPENDENT ON TONE

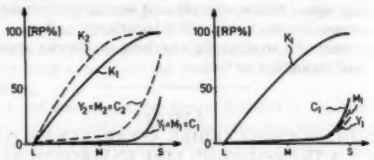
Eggert Jung, Schoenberg, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,733

Claims priority, application European Pat. Off., Apr. 10, 1982, 82103090.5

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—75 **5 Claims**



1. In a color reduction method which is dependent on tone in four-color printing, in which the color components of the chromatic printing inks are reduced and the amount of black printing ink is increased for compensating such color reduction the steps of:

increasing the black printing ink signal on the basis of nearly complete achromatic synthesis up to a gray tone value which corresponds to the full tone of the black printing ink; the improvement comprising increasing the chromatic printing ink signals from this gray tone value up to the maximum shadow.

4,551,752

METHOD AND APPARATUS FOR CORRECTING DISTORTION IN AN IMAGE WHICH IS RECORDED ELECTRONICALLY AND BUILT UP ALONG LINES

Lars E. Wall, Mölndal, and John E. Jonsson, Mölnlycke, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/000365, § 371 Date Jun. 16, 1983, § 102(e) Date Jun 16, 1983, PCT Pub. No. WO.83/01718, PCT Pub. Date May 11, 1983

PCT filed Nov. 2, 1982, Ser. No. 514,823

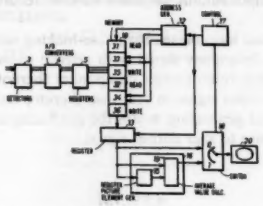
Claims priority, application Sweden, Nov. 10, 1981, 8106650

Int. Cl.⁴ H04N *5/33, 3/08*

U.S. Cl. 358—113 **11 Claims**

1. A method of correcting distortion in an image recorded electronically and built up of picture elements along lines, the distortion consisting therein that in a field of view scanned along lines, the picture elements situated vertically below each other will be horizontally displaced relatively to each other when reproduced on parallel straight lines, the improvement comprising storing the picture elements arising by scanning the field of view are stored in a memory and controllably feeding the stored picture signals a picture screen, the control being in such manner that the picture signals associated with the shortest reproduction line contain the picture elements unchanged

while in picture signals associated with longer scanning lines picture elements at definite distance from each other are fed out delayed with a time corresponding to a whole or part picture element, picture signals of corresponding length being



generated and inserted in the arising interspaces, said definite interspaces being selected in such a manner that the number per line of interspaces is proportional to the difference between the length of the respective line and of the shortest line.

4,551,753

PICTURE SIGNAL PROCESSING SYSTEM INCLUDING SPATIO-TEMPORAL FILTER

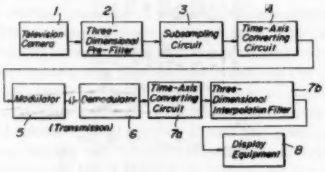
Taiji Nishizawa, and Yutaka Tanaka, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,078

Claims priority, application Japan, Dec. 17, 1981, 56-204189; May 26, 1982, 57-88018; Sep. 9, 1982, 57-155788

Int. Cl.⁴ H04N *5/02*

U.S. Cl. 358—140 **28 Claims**



1. A picture signal processing system in which a sequential scanning wideband picture signal is converted into an interlace scanning narrowband picture signal and reconverted into substantially its original state after transmission through a narrowband transmission line, comprising at a sending end:

a picture signal generating means for generating said sequential scanning wideband picture signal,

a multidimensional spatio-temporal prefiltering means for filtering aliasing signal components caused in said picture signal by sampling required for scanning conversion to provide a filtered picture signal,

a subsampling means for sampling said filtered picture signal, so as to convert said sequential scanning wideband picture signal into an interlace scanning wideband picture signal,

a time axis converting means for expanding the time axis of said interlace scanning wideband picture signal, so as to convert said interlace scanning wideband picture signal into said interlace scanning narrowband picture signal, and

a modulating means for modulating a carrier signal by said interlace scanning narrowband picture signal; and comprising at a receiving end:

a demodulating means for demodulating the modulated carrier signal, so as to restore said interlace scanning narrowband picture signal,

a time axis reconverting means for compressing the time axis of said restored interlace scanning narrowband picture signal, so as to convert said restored interlace scanning narrowband picture signal into an intermittent quasi-wideband picture signal,

a multidimensional spatio-temporal interpolation filtering means for filtering aliasing signal components in said picture signal caused by resampling required for scanning reconversion and for interpolating said intermittent quasi-wideband picture signal so as to substantially restore said sequential scanning wideband picture signal, and

a display means for displaying the substantially restored sequential scanning wideband picture signal, wherein both of said spatio-temporal prefiltering means and said spatio-temporal interpolation filtering means have a passing region substantially restricted to a lower frequency region on at least a coordinate plane extending along a vertical spatial frequency axis and a temporal frequency axis of multidimensional coordinates consisting of a horizontal spatial frequency axis, a vertical spatial frequency axis and a temporal frequency axis, provided for defining said picture signal, which lower frequency region includes an origin of said multidimensional coordinates which is separated from a higher frequency region, in which said aliasing signal components appear, by a symmetrical line intercrossing both of the vertical spatial frequency axis and the temporal frequency axis and equally distant from both of said origin and an imaginary origin corresponding to a sampling frequency employed for the sampling of said picture signal.

4,551,754

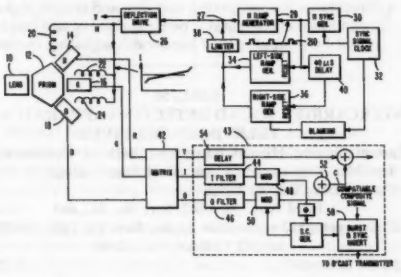
COMPATIBLE WIDE-SCREEN COLOR TELEVISION SYSTEM

William H. Meise, Wrightstown, Pa., and Robert A. Dischert, Burlington, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 18, 1982, Ser. No. 350,088

Int. Cl.⁴ H04N *5/91, 9/535*

U.S. Cl. 358—180 **20 Claims**



1. A compatible wide-angle television system comprising:

generating means for generating recurrent line-scan television signals representative of a wide-aspect ratio scene:

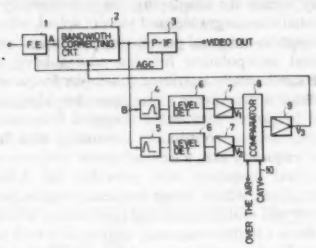
identifying means coupled to said generating means for providing an output signal manifestation identifying first signal portions of each of said line-scan television signals as relating to a relatively narrow-aspect-ratio portion of the scene and second portions as being an excess thereover;

processing means coupled to said generating means and to said identifying means for processing at least a portion of said second portion signals differently relative to said first portion signals, the different processing being selected with respect to the processing of said first portion signals such that a wide-aspect ratio signal is generated which may be displayed on a relatively narrow aspect-ratio raster with a substantial portion of said excess concealed from view.

4,551,755
TELEVISION BANDWIDTH CORRECTING SYSTEM

Kouichi Matsuda, and Youichi Sato, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,448
Claims priority, application Japan, Dec. 28, 1982, 57-22731
Int. Cl.⁴ H04N *5/44*
U.S. Cl. 358—188 **2 Claims**



1. A television bandwidth correcting system for use in a television receiver or television tuner, comprising:

a bandwidth adjusting circuit having a passband determined in accordance with a state of a signal applied to a bandwidth controlling input thereof, said bandwidth adjusting circuit receiving an input from a front end and having an output applied to an intermediate frequency amplifier of a television receiver;

video and audio band filters for filtering out video and audio components, respectively, from said output of said bandwidth adjusting circuit;

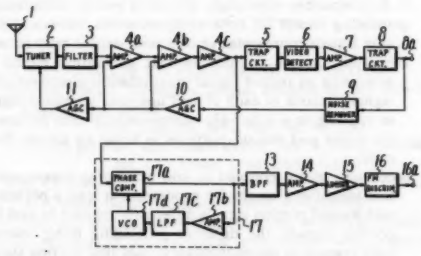
first and second level detecting means having inputs coupled to outputs of said video and audio band filters, respectively, for producing first and second signals representative of levels of video and audio components contained in a signal at said output of said bandwidth adjusting circuit; and

a comparator for comparing said first and second signals, an output of said comparator being applied to said bandwidth controlling input of said bandwidth adjusting circuit.

4,551,756
INTERCARRIER SOUND DETECTING APPARATUS FOR A TELEVISION RECEIVER

Masumi Ogawa; Hiromi Kawakami, both of Yokohama, and Toshiaki Meguro, Akishima, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,464
Claims priority, application Japan, Dec. 16, 1981, 56-203139
Int. Cl.⁴ H04N *5/62, 5/60*
U.S. Cl. 358—197 **8 Claims**



1. Sound detecting apparatus for a television receiver comprising:

receiving means for receiving a television signal including an amplitude-modulated video carrier component and a sound carrier component;

video intermediate frequency means for producing a video intermediate frequency signal having said amplitude-modulated video carrier component and said sound carrier component, in response to said received television signal;

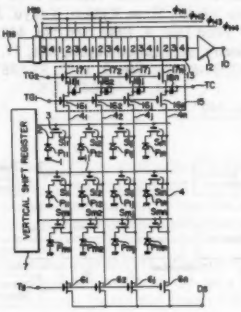
phase-locked loop means for phase-locking said video intermediate frequency signal with respect to said amplitude-modulated video carrier component thereof and producing an output signal in response thereto; and

sound signal generating means for producing a sound signal in response to said output signal.

4,551,757
METHOD FOR DRIVING SOLID-STATE IMAGE SENSOR

Yoshio Ohkubo; Yoshiaki Sone, both of Osaka; Susumu Hashimoto, Shiga; Kiyotsugu Ishikawa, Osaka; Masanori Omae, Kyoto, and Masao Hiramoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1982, Ser. No. 436,067
Claims priority, application Japan, Oct. 22, 1981, 56-169870
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—212 **5 Claims**



1. In a solid-state image sensor of the type comprising

(a) an array of photosensors disposed over one major surface of a semiconductor substrate,

(b) an array of transistor switches disposed in one-to-one correspondence relationship with said photosensors,

(c) a plurality of vertical signal lines for reading out the signal charges generated at said array of photosensors,

(d) a horizontal readout charge-coupled device (CCD) shift register, and

(e) a plurality of transfer gates equal in number to said plurality of vertical signal lines and interconnected between stages of said horizontal readout CCD shift register and said plurality of vertical signal lines, a driving method comprising the steps of:

(A) injecting bias charges having an identical value into the stages, respectively, of said horizontal readout CCD shift register,

(B) transferring signal charges from said array of photosensors to said vertical signal lines, respectively,

(C) transferring said bias charges from said horizontal readout CCD shift register through said transfer gates to said vertical signal lines, respectively, thereby adding them to said signal charges, respectively,

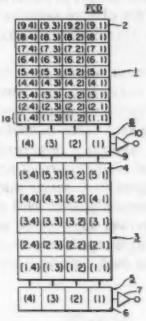
(D) transferring the sum of said signal and bias charges into said horizontal readout CCD shift register, and

(E) driving said horizontal readout CCD shift register to supply said signal charges to an output terminal.

4,551,758
IMAGE PICK-UP DEVICE AND SYSTEM

Makoto Masunaga, and Takao Kinoshita, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,536
Claims priority, application Japan, Jun. 9, 1982, 57-99861; Dec. 8, 1982, 57-215900
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—213 **39 Claims**



1. A system for generating an electrical indication indicative of an image scansion, comprising in combination:

(A) image sensing means including a plurality of one-dimensional image sensing arrays arranged in parallel with each other, each of said sensing arrays being for generating an electrical indication indicative of a line scansion of a portion of an image;

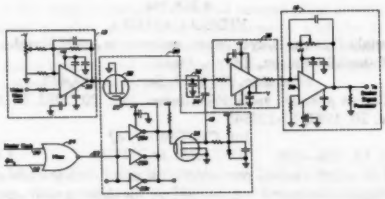
(B) storage means including a plurality of one-dimensional storage arrays arranged in parallel with each other; and

(C) control means for controlling said image sensing means and said storage means, said control means causing the sensing means to successively form, at a selected one of said sensing arrays, composite electrical indications each being composed of a selected plural number of said line scansion indications and causing the storage means to successively store said composite electrical indications formed by the sensing means.

4,551,759
SAMPLE VIDEO AMPLIFIER

Daniel L. Crabtree, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1983, Ser. No. 484,657
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—213 **2 Claims**



1. A sample video amplifier for amplifying a raw video signal from a charge coupled device array having multiple phase horizontal shift signals and a master clock signal, comprising:

a mixer for inputting said master clock signal and one of said horizontal shift signals and producing a sample signal output;

a first stage gain for inputting said raw video signal and amplifying said raw video signal to a preselected level;

an inverter electrically connected to said mixer;

a switching transistor electrically connected to said inverter and to said first stage gain for sampling said raw video signal, said switching transistor being controlled by a signal from said mixer;

a sample capacitor electrically connected to said switching transistor for storing said sampled video signal;

a reset electrically connected between said inverter and said sample capacitor for clearing said sample capacitor upon a preselected reset signal;

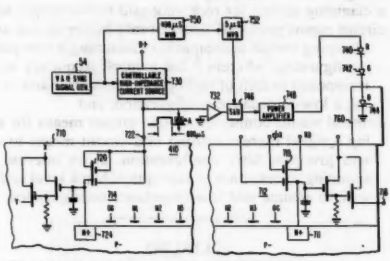
a hold circuit electrically connected to said sample capacitor for maintaining said sampled video signal until a fresh sample pulse occurs; and

a second stage gain electrically connected to said hold circuit for inputting the output of said hold circuit and amplifying said hold circuit output to a preset level.

4,551,760
TELEVISION CAMERA WITH SOLID-STATE IMAGERS COOLED BY A THERMAL SERVO

Sidney L. Bendell, Burlington, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 16, 1983, Ser. No. 532,958
Int. Cl.⁴ H04N *3/15, 9/04, 9/07, 9/09*
U.S. Cl. 358—213 **4 Claims**



1. A thermal servo for a television camera, comprising:

a solid-state imager responsive to clock signals and including a photosensitive surface responsive to incident light from a scene for generating output signals representative of said scene;

synchronizing means coupled for controlling said clock signals applied to said imager such that said photosensitive surface develops integrated incident light signals during recurrent field intervals and transfers said integrated incident light signals out of said photosensitive surface during recurrent transfer intervals as said output signals of said imager;

thermoelectric cooling means coupled to said imager for cooling said imager for reducing thermal noise in said output signals of said imager;

temperature sensing means coupled to said imager for developing a signal representative of the temperature of said imager during said recurrent transfer intervals;

drive means coupled to said thermoelectric cooling means and responsive to a temperature control signal for energizing said thermoelectric cooling means for closing a thermal servo loop for stabilizing the temperature of said imager; and

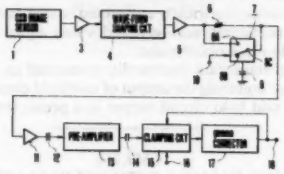
sample-and-hold means coupled between said temperature sensing means and said drive means and responsive to said signal representative of the temperature of said imager for developing said temperature control signal during said recurrent transfer intervals and for applying said tempera-

ture control signal to said drive means during said recurrent field intervals.

4,551,761
SIGNAL PROCESSING CIRCUIT INCLUDING IMAGE SENSOR

Masatoshi Sase, Kanagawa, and Seisuke Yamanaka, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,621
Claims priority, application Japan, Feb. 25, 1983, 58-26780[U]
Int. Cl.⁴ H04N *3/15*
U.S. Cl. 358—213 **6 Claims**

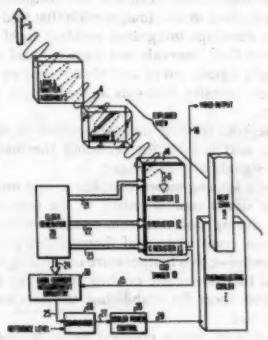


1. A signal processing circuit comprising:
an image sensor having an optical black level detecting portion and producing an output signal alternately representing a sensed image and said optical black level;
a buffer circuit for receiving said output signal and producing a buffer output signal;
a clamping circuit for receiving said buffer output signal;
circuit means provided between said buffer circuit and said clamping circuit and capable of assuming a low-pass filter configuration wherein it has a cutoff frequency such that it responds to drift of said optical black level and of assuming a low-impedance configuration; and
terminal means connected to said circuit means for supplying a signal thereto causing said circuit means to assume said low-pass filter configuration, in an interval corresponding to detection of said optical black level and otherwise to assume said low-impedance configuration.

4,551,762
DARK-CURRENT LEVEL REGULATION IN SOLID-STATE DEVICES

Peter A. Levine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 18, 1984, Ser. No. 571,719
Int. Cl.⁴ H04N *5/16*
U.S. Cl. 358—221 **11 Claims**



1. A television camera comprising:
a solid-state imager having therein one or more area registers for holding at times charge samples descriptive of a received image, in at least a portion of which said one or more area registers at other times charge samples are to be found descriptive only of accumulated dark current;
thermoelectric cooling means for cooling said solid-state imager;
means for controlling the amount of power supplied to said thermoelectric cooler in response to an error signal, whereby the temperature of said solid-state imager is modified and consequently the dark current generated within said solid-state imager is accordingly modified;
means, responsive to the charge samples descriptive of the received image, for obtaining a video output signal from said imager;
dark current measurement means, responsive to the charge samples descriptive only of accumulated dark current, for obtaining a signal representing the level of dark current noise accompanying said video output signal;
means for comparing, against a reference value, the signal representing the level of dark current noise accompanying said video output signal to generate said error signal; and
means applying said error signal to said means for controlling the amount of power supplied to said thermoelectric cooler, for completing a regulatory feedback loop to limit the amplitude of said dark current noise.

4,551,763
DIAGONAL SWEEP SHUTTER MECHANISM FOR VIDEO TAPE CAMERA

Steven L. Swinehart, and Werner H. Kuhn, both of Albuquerque, N. Mex., assignors to Nisus Video Incorporated, Albuquerque, N. Mex.

Filed Dec. 16, 1983, Ser. No. 562,280
Int. Cl.⁴ H01N *5/30*
U.S. Cl. 358—225 **8 Claims**

1. A focal plane shutter for a video camera having a lense and pickup comprising:
disk means disposed between said lense and said pickup for rotation about an axis;
said disk means having an opening bounded on first and second sides by lines emanating from a point on said disk offset from said axis of rotation.

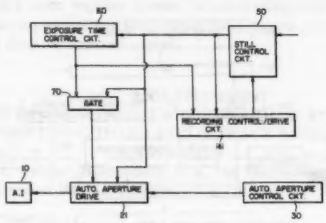
4,551,764
VIDEO CAMERA

Kimiaki Ogawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,483
Claims priority, application Japan, Dec. 20, 1982, 57-223544; Dec. 20, 1982, 57-223545
Int. Cl.⁴ G01J *1/42*
U.S. Cl. 358—228 **5 Claims**

1. A video camera provided with an automatic aperture and an automatic aperture drive circuit for driving said automatic aperture, comprising: a still control circuit for producing a still control signal representative of a still picture photographing operation; a programmed exposure time control circuit for producing an exposure time control signal; and a gate circuit receiving said exposure time control signal and said still signal for producing in response thereto an automatic aperture shutter control signal applied to control an automatic opening and

closing operation of said automatic aperture for still picture photographing, wherein said automatic aperture is closed in response to said still signal and returned to an opened state in response to both said still signal and said exposure time control signal, and then said automatic aperture is the closed in response to disappearance of said exposure time control signal to effect a still picture photographing operation, and for photographing operations other than still picture photographing, automatic operation of said automatic aperture is carried out in accordance with the brightness of an object being photographed

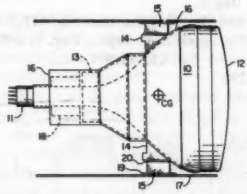


4,551,765

CATHODE RAY TUBE VIBRATION ISOLATOR

Edward A. Meeder, Jr., Little Ferry, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 26, 1981, Ser. No. 314,613
Int. Cl.[4] H04N *5/645*
U.S. Cl. 358—248 **5 Claims**



1. Apparatus for mounting a cathode ray tube in a housing which is subject to vibrations and to isolate the tube from the vibrations, comprising:

a shield potted to the tube;

a plurality of resilient means mounted to the shield external thereto and mounted to the housing, and disposed in a plane passing through the center of gravity of the tube;

each of the plurality of resilient means including a bracket mounted to the shield and a pad mounted to the bracket and the housing; and

each of the pads including a first and second plate having a resilient member sandwiched therebetween, with the first plate having means for mounting said first plate to a corresponding bracket and the second plate having means for mounting said second plate to the housing.

4,551,766

OPTICAL READER

John E. Mosier; Jim B. Surjaatmadja, and Jack C. Penn, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 8, 1982, Ser. No. 355,465
Int. Cl.[4] H04N *1/00*
U.S. Cl. 358—256 **6 Claims**

1. An optical reader, comprising:

a housing;

a drum rotatably mounted in said housing for receiving indicia-carrying means which is to be read by said optical reader;

drum drive means for rotating said drum about a longitudinal axis;

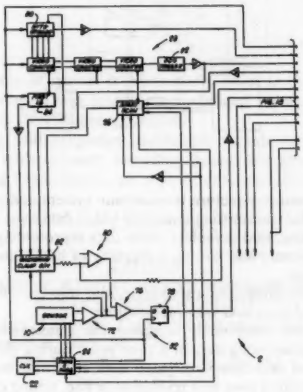
illumination means for illuminating the indicia-carrying means when it is mounted on said drum;

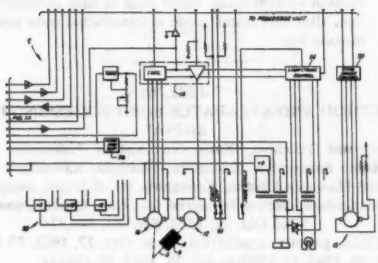
optical lens means for receiving light reflected from said indicia-carrying means mounted on said drum;

photo-responsive means for converting said light received by said optical lens means into electrical signals;

carriage means having said optical lens means and said photo-responsive means mounted thereon;

carriage movement means for moving said carriage means and said optical lens means and said photo-responsive means mounted thereon substantially parallel to said longitudinal axis of said drum;





control means for incrementally activating said carriage movement means to position said optical lens means and said photo-responsive means along the length of said drum and for actuating said drum drive means for incrementally rotating said drum after said carriage movement means has positioned said carriage means at a predetermined position along the length of said drum; and

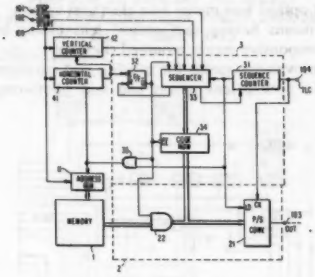
wherein said housing includes a cover slidably disposed therein, said cover being movable to an open position underlying said drum for receiving the indicia-carriage means if said drum does not properly receive the indicia-carrying means while said cover is at said open position.

4,551,767

STATIONARY-PICTURE TRANSMISSION SYSTEM

Toshiaki Higashiguchi, and Michiaki Sonoda, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,635
Claims priority, application Japan, Jan. 30, 1982, 57-13981
Int. Cl.⁴ H04N *1/32*
U.S. Cl. 358—257 **8 Claims**



1. A stationary-picture transmission system comprising:
means for transmitting complete video data over a transmission line, said complete video data representing a stationary-picture and having a plurality of horizontal scanning periods;
means for producing a stop code, said stop code being transmitted over said transmission line;
means for temporarily stopping the transmission of said complete video data at a time point during the transmission of said complete video data after said stop code is transmitted over said transmission line, timing of the stopping of the transmission being responsive to said horizontal scanning periods;
means for producing a restart code, said restart code being transmitted over said transmission line; and
means for restarting said transmission to complete the transmission of remaining video data in said complete video data after said restart code is transmitted over said transmission line.

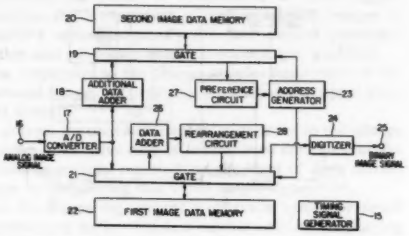
4,551,768

METHOD AND APPARATUS FOR PROCESSING IMAGE SIGNAL

Hiroyoshi Tsuchiya, Kanagawa; Katsuo Nakazato, Tokyo; Kunio Sannomiya, Kanagawa; Hidehiko Kawakami, Tokyo, and Hirotaka Otsuka, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 27, 1983, Ser. No. 545,926
Claims priority, application Japan, Oct. 27, 1982, 57-188401; Jul. 28, 1983, 58-138016; Jul. 28, 1983, 58-138017
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—283 **13 Claims**

1. A method for processing an image signal, comprising:
a first step of storing in image signal memory means image signal levels of picture elements which are obtained by scanning an original image in a divided manner;
a second step of producing data obtained by adding to the image signal levels additional data which imparts regularity to image signals to be displayed;
a third step of obtaining a sum S of the image signal levels of all the picture elements within a scanning window which has a size corresponding to M picture elements and which scans said image signal memory means, and obtaining values of N and A which satisfy an equation $S=C\times N+A$ for $0\leqq A<C$ where C is a predetermined image signal level, N is an integer, and A is a remainder;
a fourth step of numbering the image signal levels in accordance with one of ascending and descending orders so as to assign an order of preference to all the picture elements within the scanning window in accordance with sum data obtained in the third step;
a fifth step of assigning C as an image signal level to N picture elements in one of the ascending and descending



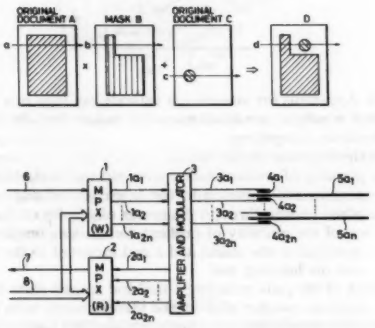
orders, A as an image signal level to a next picture element, and 0 as an image signal level to remaining picture elements; and
a sixth step of moving the scanning window by a predetermined number of picture elements so as to correspond to memory locations of said image signal memory means.

4,551,769

PICTURE IMAGE PROCESSING MAGNETIC DISC CONTROLLING METHOD AND APPARATUS THEREFOR

Masato Satoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 447,363
Claims priority, application Japan, Dec. 7, 1981, 56-195710
Int. Cl.⁴ H04N *1/22*
U.S. Cl. 358—296 **9 Claims**



7. An apparatus for controlling a plurality of magnetic discs for processing a picture image wherein each of said discs have first and second recording surfaces each of said recording surfaces have a plurality of tracks, and each of said tracks have a plurality of positions therein, said apparatus comprising:
a plurality of magnetic discs;
a plurality of magnetic heads for writing into and reading out signals in a predetermined region of said magnetic discs; wherein, two separate signals are sequentially stored at two separate regions of said magnetic discs and then simultaneously, read out and combined to produce a new composite signal;
multiplexer code means for setting the positional access

between said magnetic heads and said magnetic discs; so that a particular magnetic head can be actuated;

writing head selector means for receiving information signals to be written into said magnetic discs;

reading head selector means for transmitting information signals read from said magnetic discs; and

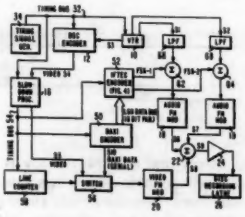
multiplex code register means for controlling both of said receiving means and said transmitting means as a function of a received control signal.

4,551,770

VIDEO DISC ENCODING AND DECODING SYSTEM PROVIDING INTRA-FIELD TRACK ERROR CORRECTION

Richard C. Palmer, Blawenburg, N.J., and Michael A. Plotnick, Southampton, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 6, 1984, Ser. No. 567,535
Int. Cl.[4] H04N *5/781*
U.S. Cl. 358—342 **3 Claims**



1. A method for forming a video disc recording signal for facilitating intra-field track error correction upon subsequent playback of video disc records recorded with said disc recording signal comprising the steps of:

(a) providing first and second baseband sound signals, a baseband video signal and a data sequence representative of field numbers of said video signal;

(b) providing a subset of said data sequence representative of track identification numbers;

(c) encoding said subset of said data sequence on first and second frequency shift keyed carrier waves;

(d) combining said first baseband sound signal with said first carrier wave to form a first resultant signal and combining said second baseband sound signal with said second carrier wave to form a second resultant signal;

(e) applying said baseband video signal and said resultant signals to respective frequency modulators; and

(f) summing the output signals produced by said frequency modulators to provide said video disc recording signal.

4,551,771

METHOD AND APPARATUS FOR RECORDING DIGITAL INFORMATION IN ALTERNATE RECORDING TRACKS

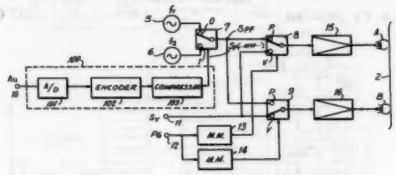
Yukihiko Machida, Seki; Kenji Nakano, Ebina, and Takao Takahashi, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,103
Claims priority, application Japan, May 14, 1981, 56-72461
Int. Cl.[4] H04N *5/782*
U.S. Cl. 360—19.1 **26 Claims**

1. A method of recording first and second information signals in adjacent parallel tracks on a record medium, said first information signal having frequency modulated components and said second information signal being an analog signal, comprising the steps of:

digitizing said second information signal to produce an encoded digital signal representative thereof having a preselected frequency;

producing frequency modulated signals from said encoded digital signal, whereby said frequency modulated signals have an instantaneous frequency which is one of two selected frequencies based on the state of the encoded digital signal and has a frequency spectrum, the central



frequency of which, is substantially equal to the central frequency of said frequency modulated components of said first information signal; and

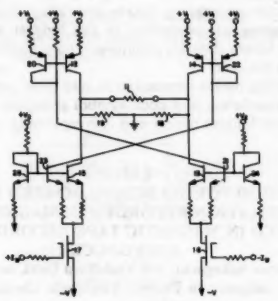
recording said frequency modulated signals in alternate tracks with alternate recording heads, said alternate recording heads having air gaps of difference azimuth angles.

4,551,772

WRITE DRIVE WITH CURRENT MIRRORS WHICH REDUCE FEED-THROUGH

David E. Sliger, Lafayette, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Mar. 28, 1984, Ser. No. 594,263
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—46 **4 Claims**



1. A write driver circuit for a magnetic head comprising:

first and second driver transistors connected on both sides of said head to produce current flow through said head in one direction;

third and fourth driver transistors connected on both sides of said head to produce current flow through said head in the other direction;

first and second current mirror transistors connected in parallel with said first and second driver transistors to produce current flow in a path parallel to said head to maintain the current flow through said first and second driver transistors equal; and

third and fourth current mirror transistors connected in parallel with said third and fourth driver transistors to produce current flow in a path parallel to said head to maintain the current flow through said third and fourth driver transistors equal.

4,551,773

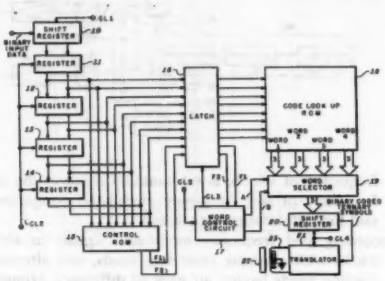
ENCODING AND DECODING APPARATUS AND METHOD UTILIZING HIERARCHICAL CODE SUBSTITUTION

Martin Cohn, Arlington, Mass.; George V. Jacoby, Los Altos, and Jorgen P. Vinding, Monte Sereno, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 16, 1982, Ser. No. 398,744

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—40 **37 Claims**



1. Apparatus for encoding binary data into corresponding code signals comprising

data storage means for receiving input binary data and forming said input binary data into a plurality of input data bits,

code generating means responsive to said plurality of input data bits for storing a plurality of variable length code symbol groupings corresponding to variable lengths of binary data bit groupings,

at least two of said binary data bit groupings matching the same plurality of input data bits,

each plurality of input data bits being matched by at least one of said binary data bit groupings,

said code generating means providing the code symbol grouping corresponding to the longest match between said binary data bit groupings and said plurality of input data bits, and

translating means responsive to said code generating means for translating said code symbol grouping corresponding to said longest match into corresponding code signals.

4,551,774

METHOD FOR SELECTING DESIRED PIECE OF INFORMATION RECORDED IN MAGNETIC TAPE MOUNTED IN MAGNETIC TAPE RECORDER AND/OR REPRODUCER

Shouzaburou Sakaguchi, and Yoshiharu Ueki, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 353,349, Mar. 1, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,244

Claims priority, application Japan, Mar. 2, 1981, 56-29570; Mar. 2, 1981, 56-29571; Mar. 5, 1981, 56-31486

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—72.1 **6 Claims**

1. A device for selecting a desired piece of information recorded on a magnetic tape having blank portions and recorded portions and mounted in a tape player system having a magnetic head and a tape transport structure adapted to perform one of operational modes including a PLAY mode for a normal playback of recorded information, a CUE mode and a REVIEW mode in which the tape is moved respectively forward and backward at a speed higher than a normal playback speed while said magnetic head is engaged for picking up the recorded information on the magnetic tape, said device comprising:

(a) means for generating an audio pulse train signal in response to an output signal of said magnetic head, which audio pulse train signal has a plurality of pulses corresponding to high level portions of recorded information for each of said recorded portions;

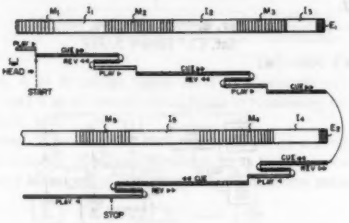
(b) a clock signal generating means for generating a clock signal of a predetermined frequency;

(c) a counter means having a clock input terminal and a reset input terminal;

(d) a first switch means for connecting said clock signal and said audio pulse train signal respectively to said clock input terminal and said reset input terminal of said counter means;

(e) a second switch means for connecting said audio pulse train signal to said clock input terminal of said counter means; and

(f) a control means having a first operational means for selecting said CUE mode and activating said first switch



means to detect that a blank portion is present when a content of said counter means has reached a predetermined value due to absence of said audio pulse train signal at said reset terminal and activating said second switch means when a blank portion is detected, said control means having a second operational means for selecting said REVIEW mode when a leading edge of a next one of recorded portions is detected from the content of the counter means when the second switch means is activated during said CUE mode and thereafter activating said first switch means during said REVIEW mode to detect a blank portion, and said control means having a third operational means for selecting said PLAY mode when the blank portion is detected from the content of the counter means during REVIEW mode in which the first switch means is activated.

4,551,775

TAPE RECORDER WITH TWO RECORDING/PLAYING MECHANISMS

Satoru Koizumi; Hiroshi Furuhara, and Daisuke Teshima, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 24, 1981, Ser. No. 334,361

Claims priority, application Japan, Dec. 24, 1980, 55-188029; Dec. 24, 1980, 55-188030

Int. Cl.⁴ G11B *15/48, 15/00*

U.S. Cl. 360—74.1 **7 Claims**

1. A tape recorder comprising:

first and second recording/playing mechanisms for driving a tape at a constant speed for recording or playing;

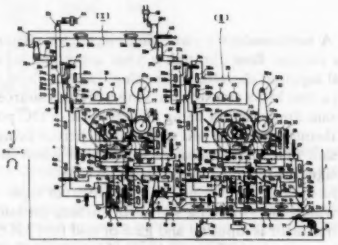
an auto-stop assembly for discontinuing operation of said first or second recording/playing mechanism when an end of the tape approaches;

a control assembly for placing said first or second recording/playing assemblies selectively into a first stop mode or a second stop mode, said first stop mode being the mode from which said first or second recording/playing mechanisms is adapted to be switched into a constant driving mode independently of each other and said second stop mode being the mode from which the constant driving mode is adapted to be switched from said first recording/playing mechanism to said second or vice versa;

a link assembly connected between said auto-stop assembly and said control assembly for rendering said control assembly operable to shift the constant driving mode from said first recording/playing mechanism to said second or vice versa upon the completion of the constant driving mode in said second or first recording/playing mechanism;

a first driving motor and a second driving motor operatively connected to said first and second recording/playing mechanisms, respectively, each driving motor is provided for execution of the constant driving mode and each of the driving motors is adapted to assist the control assembly for bringing the associated recording/playing mechanism into a desired operating mode;

means for sensing the completion of the constant driving mode of said first recording/playing mechanism as the end of the tape approaches, and for enabling the motor for said second recording/driving mechanism in response to said auto-stop assembly responsive to the completion of the constant driving mode in said first recording/playing



mechanism and wherein the constant driving mode is taken over from said first recording/ playing mechanism automatically; and

means for sensing the completion of the constant driving mode of said second recording/playing mechanism as the end of the tape approaches, and for enabling the motor for said first recording driving mechanism in response to said auto-stop assembly responsive to the completion of the constant driving mode in said second recording/playing mechanism and wherein the constant driving mode is taken over from said second recording/playing mechanism automatically;

said control assembly includes a first cam gear and first cam operatively connected to said first driving motor and a second cam gear and second cam operatively connected to said second driving motor, said first and second cam gears and first and second cams being operatively connected to said link assembly for assisting in the shifting of the constant driving mode from said first recording/playing mechanism to said second or vice versa.

4,551,776

AUTOMATIC REFERENCE ADJUSTMENT FOR POSITION ERROR SIGNAL ON DISK FILE SERVO SYSTEM

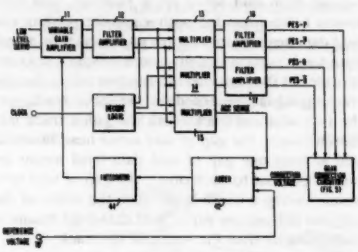
Howard J. Roalson, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,583
Int. Cl.[4] G11B *21/10*
U.S. Cl. 360—77 **4 Claims**

1. A system for automatically calibrating servo circuitry used with a servo pattern in which a position error signal (PES) is generated, said servo circuitry including a variable gain amplifier involved in generating said PES, said servo pattern having a primary signal P and a quadrature signal component Q in quadrature with said primary signal, said P and said Q signals having linear portions except near their peaks, a signal representing the sum of said P and said Q signals having a flat portion corresponding to said linear portions of said P and said Q signal, comprising

means for generating a $\overline{P}$ signal and a $\overline{Q}$ signal,

means for separately, averaging the following combinations of said signals



P+Q, P+Q, P+Q, P+Q

means for comparing the amplitudes of said averaged signals with a first reference voltage, and

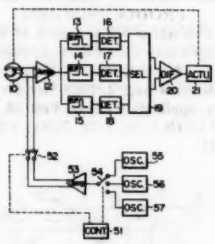
means responsive to the results of said comparison for modifying the gain of said amplifier to change said PES.

4,551,777

TRACKING SERVO SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS USING FLEXIBLE MAGNETIC DISK

Tadashi Saito; Shigemitsu Higuchi, both of Yokohama; Kazutoshi Konno, Yokosuka; Tohru Sampei, Kanagawa; Kenji Hayashi, Kamakura; Yoshihiko Noro, and Manabu Wakabayashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1982, Ser. No. 407,080
Claims priority, application Japan, Aug. 24, 1981, 56-131501
Int. Cl.[4] G11B *21/10, 5/27*
U.S. Cl. 360—77 **5 Claims**



1. A tracking servo system for a magnetic recording and reproducing apparatus using a flexible magnetic magnetic disk, comprising:

the flexible magnetic disk having on one magnetic surface thereof a plurality of adjacent tracks, each track including a data track portion on which an information signal is to be recorded and a pair of servo track portions which are located on both sides of the data track portion and on which a tracking signal is recorded, different frequencies being respectively alloted to the tracking signals recorded on the servo track portion pairs of at least three adjacent tracks, the pair of servo track portions located on both sides of the data track portion having the same frequency;

a magnetic head assembly including a data head means and a servo head means formed in a unitary structure, said data head means being movable over said flexible magnetic

disk, said data head means being provided with at least one gap for forming the data track portion in a given one of said tracks to record the information signals thereon and for reading out the recorded information signals therefrom, said servo head means being movable together with said data head means for reading out the tracking signals from said servo track portions, said servo head means being provided with a gap for reading out, when said data head means records an information signal on the data track portion in a given one of said tracks and when it reads out the recorded information signal therefrom, the tracking signals recorded on the servo track portions in the two adjacent tracks with the given track interposed therebetween, the gap of said servo head means and said said at least one gap of said data head means being arranged parallel to each other, the gap of said servo head means having a width larger than the width of the track, and said at least one gap of said data head means having a width smaller than the width of the track;

a tracking error detection circuit for receiving the tracking signals read out from said servo head means to produce an output signal proportional to a difference in amplitude therebetween; and

an actuator responsive to the output signal of said tracking error detection circuit for urging said data head means to a correct position of the data track portion in said given track.

4,551,778

MAGNETIC RECORDING MEDIA AND PROCESS OF PRODUCING THEM

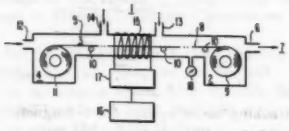
Yoshihiro Arai, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Division of Ser. No. 348,883, Feb. 16, 1982, Pat. No. 4,419,404. This application Aug. 2, 1983, Ser. No. 519,641

Claims priority, application Japan, Feb. 16, 1981, 56-21652

Int. Cl.⁴ G11B *5/74, 5/78, 23/00*; A23C *9/12*

U.S. Cl. 360—131 **2 Claims**



1. A process for producing a magnetic recording medium, comprising the steps of:

forming a thin ferromagnetic metal layer on a surface of a non-magnetic, flexible support by vacuum obliquely injecting vapor deposition; and

forming an overcoat layer on said ferromagnetic metal layer, by performing plasma polymerizations of a fluorine free monomer gas, such that said overcoat layer is formed on said ferromagnetic metal layer in such a manner that the fluorine content of said overcoat layer continually increases in a direction away from said ferromagnetic metal layer.

4,551,779

SEMICONDUCTOR SWITCHING CIRCUIT WITH AN OVERCURRENT PROTECTION

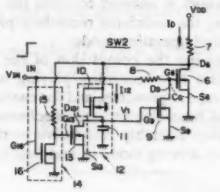
Koichi Murakami, Yokosuka, and Takeshi Oguro, Tokyo, both of Japan, assignors to Nissan Motor company, Limited, Yokohama, Japan

Filed Oct. 11, 1983, Ser. No. 540,666

Claims priority, application Japan, Oct. 12, 1982, 57-178785; Nov. 30, 1982, 57-209987

Int. Cl.⁴ H02H *3/26*

U.S. Cl. 361—86 **11 Claims**



1. A semiconductor switching circuit for switching on and off a current flow through a load according to a switching signal inputted thereto, comprising:

(a) a first MOS transistor having a drain, a source and a gate, said drain thereof being connected to a DC power supply through the load and said source thereof being grounded, said first MOS transistor turning on when the switching signal is received at said gate thereof;

(b) a first resistor connected between an input terminal at which the switching signal for turning on said first MOS transistor is inputted and gate of said first MOS transistor;

(c) a second MOS transistor, a drain thereof connected to the gate of said first MOS transistor and a source thereof being grounded, said second MOS transistor operatively turning on to ground the gate of said first MOS transistor so as to forcefully turn off said first MOS transistor when a first signal exceeding a threshold voltage is received at a gate thereof; and

(d) circuit means for detecting a change in a drain potential of said first MOS transistor after the switching signal is applied to the gate of said first MOS transistor and outputting the first signal to the gate of said second MOS transistor when the drain potential of said first MOS transistor remains at a high level, said circuit means being responsive to said drain potential for outputting as said first signal a voltage having a level which increases to a level near said drain potential high level when said drain potential remains at said high level.

4,551,780

APPARATUS FOR REDUCING SUBSYNCHRONOUS FREQUENCIES IN A POWER SUPPLY

Muzaffer Canay, Birr, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 27,407, Apr. 5, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,545

Claims priority, application Switzerland, Jan. 10, 1979, 212/79

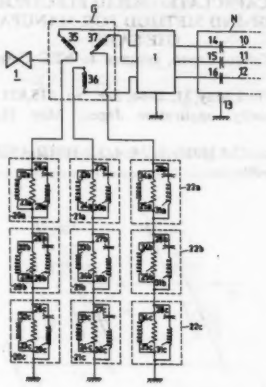
Int. Cl.⁴ H02H *7/06*

U.S. Cl. 361—113 **9 Claims**

1. In a power transmission system comprising a turbine-driven multiphase synchronous generator for supplying power signals at a predetermined rated frequency to a transmission line network by means of a multiphase block transformer, wherein at least one of said generator and said transformer includes a secondary winding having a plurality of phase windings, the high-voltage terminals of which are respectively connected to respective transmission lines of said network, and further including a line of shafts connecting the turbine to the generator that exhibit one or more natural frequencies lower

than said rated frequency, a system for protecting said line of shafts from damage due to oscillations at said natural frequencies, comprising:

a plurality of damping resistors directly and separately connecting the low voltage terminals of said phase windings to a neutral potential terminal; and



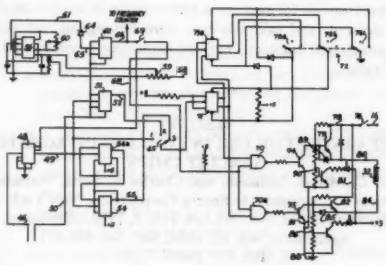
a series resonant circuit tuned to said predetermined rated frequency connected in parallel with each of said damping resistors whereby said damping resistors have negligible effect on signals at said predetermined rated frequency and are effective to damp out signals at frequencies other than said predetermined rated frequency.

4,551,781

CONTROL CIRCUIT FOR MAGNETIC PROBE

Rocky S. Bykerk, Newport, Wash., assignor to Chris G. Nicholson, Richmond; J. Gid Parrish, Dekalb, both of, Ga.; Ivan H. Brown, Sonoma, Calif. and Reuben H. Gordon, Richmond, Ga.

Filed Aug. 3, 1983, Ser. No. 519,820
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—143 **6 Claims**



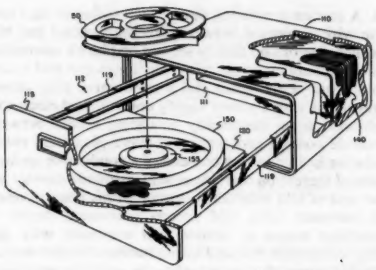
1. A magnet control circuit comprising a power supply, clock means for providing pulses at a fixed rate, first dividing means for dividing said fixed rate and providing a first pulse rate, second dividing means for dividing said fixed rate and providing a second pulse rate, selector switch means selectively connectable for receiving said first pulse rate and said second pulse rate, a coil constituting said magnet, a first transistor connected to one side of said coil, a second transistor connected to the opposite side of said coil, gate means for selectively causing said first transistor to conduct for connecting said one side of said coil to ground, said opposite side of said coil being connected to a positive voltage from said power supply, and for selectively causing said second transistor to conduct for connecting said other side of said coil to ground, said one side of said coil being connected to a positive voltage from said power supply, and circuit means for selectively connecting said selector switch to said gate means.

4,551,782

METHOD AND APPARATUS FOR DEGAUSSING MAGNETIC STORAGE MEDIA

Earle S. Seely, Boonton, and Roger O. LaValley, Hopatcong, both of N.J., assignors to RFL Industries, Inc., Boonton, N.J.

Continuation-in-part of Ser. No. 530,658, Sep. 9, 1983. This application May 7, 1984, Ser. No. 607,681
Int. Cl.[4] H01F *13/00*
U.S. Cl. 361—151 **27 Claims**



1. A method for degaussing a reel of magnetic tape, comprising the steps of:

(a) simultaneously rotating the magnetic tape reel on its axis and applying a transverse magnetic field substantially in the plane of the reel, the transverse magnetic field being applied first in one direction and then in the opposite direction; and

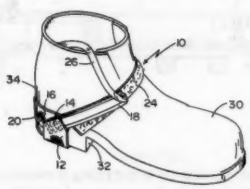
(b) applying an axial magnetic field substantially parallel to the axis of the reel, the axial magnetic field being applied first in one direction and then in the opposite direction.

4,551,783

HEEL GROUNDING STRAP

Lenard Cohen, Brighton, and Michael E. Gordon, Wayland, both of Mass., assignors to Plastic Systems, Inc., Marlboro, Mass.

Filed Oct. 19, 1984, Ser. No. 662,785
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—223 **6 Claims**



1. A grounding device comprising: a pair of straps connected together at right angles at their ends; fastener means connected to said ends of said straps; and an elongated conductor connected to one end of said straps; said grounding device characterized in that said straps each comprise a conductive elastomer, each strap thereby comprises a grounding strap, said grounding straps are of substantially equal length, and the length of said grounding straps is such that with either grounding strap extending about a shoe counter, the other grounding strap will be positioned under the heel of said shoe.

4,551,784

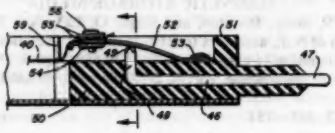
CORONA GENERATING DEVICE

Ernest L. DiNatale, Rochester, and Robert J. Yax, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1984, Ser. No. 626,518

Int. Cl.[4] H01T *19/04*

U.S. Cl. 361—225 **11 Claims**



1. A corona generating device comprising at least one coronode wire supported between first and second end block assemblies, one of said first or second end block assemblies comprising a conductive electrode having at one end a coronode contact and at the other end a conductive plug adapted for engagement with a power supply contact, said electrode being positioned in an electrically insulating holder between said coronode contact and said conductive plug, said electrically insulating holder having one end of a conductive spring means mounted thereto on one side of said coronode contact with the other end of said conductive spring means being connected to said coronode wire, said corona generating device further comprising means to tension said coronode wire and said spring means such that said spring means is in electrical contact with said coronode contact whereby said coronode wire may be energized and wherein in the event said coronode wire ruptures the spring acts as a circuit breaker returning to its untensioned position breaking electrical contact with said coronode contact.

4,551,785

CAPACITIVE SENSOR

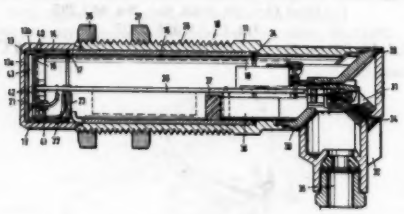
Holger Kröner, Schopfheim, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,848

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328210

Int. Cl.[4] G01F *23/26*

U.S. Cl. 361—284 **14 Claims**



1. A capacitive sensor comprising a tubular plastic housing closed at the front end, a sensor electrode disposed in the interior of the housing at the front end thereof, at least one tubular shield electrode, the electrodes being arranged in the interior of the housing in such a manner that they adjoin each other a small distance apart, an electronic circuit which is disposed in the interior of the housing and is connected on the one hand to the electrodes and on the other hand to a cable led at the back out of the housing, the plastic housing including a tubular body and a cup-shaped cap, the sensor electrode being formed of a shock-resistant metal member and being disposed in the cap, the shield electrode being an impact-resistant metal tube and being disposed in the tubular body, a stop disposed on the inner side of the tubular body for supporting the rear end of the shield electrode introduced from the front into the body, an insulating spacer member between the electrodes, and means for tightly connecting the cup-shaped cap and the tubular body to each other.

4,551,786

UNENCAPSULATED SOLID ELECTROLYTIC CAPACITOR AND METHOD FOR MANUFACTURING THE SAME

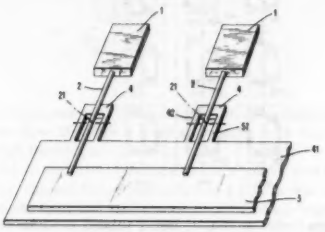
Hideo Oka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,821

Claims priority, application Japan, May 31, 1983, 58-82377[U]

Int. Cl.[4] H01G *1/14, 4/32;* H01R *4/02*

U.S. Cl. 361—306 **9 Claims**



5. An unencapsulated solid electrolytic capacitor, comprising:

a substantially flat capacitor element having a planar principal surface and a longitudinal axis and including a flat anode body, a dielectric layer formed on the anode, a semiconductor layer formed on the dielectric layer and a cathode layer formed on the semiconductor layer;

an anode lead-out wire connected to the anode body and extending along the longitudinal axis of said capacitor element; and

a solderable flat anode terminal plate welded to said lead-out wire in the same plane as that of the principal surface of said capacitor element, said terminal plate having a pair of protrusions formed on a side remote from the capacitor element, and said lead-out wire having an end portion positioned between, but not extending beyond, said protrusions.

4,551,787

APPARATUS FOR USE IN COOLING INTEGRATED CIRCUIT CHIPS

Faquir C. Mittal, Audubon, and Charles R. Solis, Warminster, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 464,294, Feb. 7, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 649,877

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—387 **1 Claim**

1. A cooling apparatus including integrated circuit chips comprising:

a cold plate;

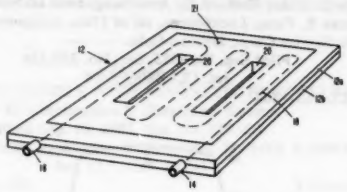
a first film of paste in contact with said plate, said first film being heat conductive and electrically insulative;

a second film in contact with said first film, said second film having a predetermined array of interconnected metallic pads;

a third film in contact with said second film, said third film being heat conductive and electrically insulative, said films comprising a compliant mat;

a substrate having a plurality of circuit packages including

integrated circuit chips in a predetermined array corresponding to said array of metallic pads; and



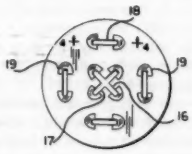
each of said circuit packages being in contact with said third film adjacent an associated metallic pad.

4,551,788

MULTI-CHIP CARRIER ARRAY

Robert P. Daniel, 12932 Brittany Woods, Santa Ana, Calif. 92705, and Larry Yglesia, 2301 Coco Palm, Tustin, Calif. 92680

Filed Oct. 4, 1984, Ser. No. 657,596
Int. Cl.⁴ H05K *1/02*
U.S. Cl. 361—403 **3 Claims**



1. An improved multi-chip carrier array of the type having:
a. individual carriers defined by two perpendicular sets of parallel lines scribed on either of the planar surfaces of a thin sheet of insulating material,
b. a plurality of oblong feed-through perforations equally spaced about the perimeter of each carrier such that adjacent carriers share perforations along common borders, and
c. solder pads located on one of said planar surfaces at the site of each oblong perforation,
d. a feed-though extension of each pad, said extension being adhered to the perforation wall and extending to the surface of said sheet opposite that on which said pads are located,

wherein the improvement comprises:

the major axes of all oblong perforations being bisected by at least one scribe line; and

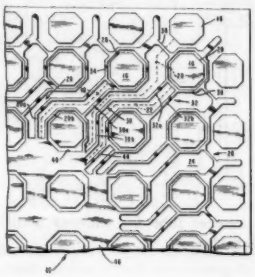
each oblong perforation having first and second solder pads positioned around its opposite ends on the same planar surface, each solder pad having a feed-through extension which extends to the other planar surface, said feed-through extensions being adhered to the perforation wall, and said first solder pad and associated feed-through extension being separated from said second solder pad and associated feed-through extension by an insulating gap.

4,551,789

MULTILAYER CERAMIC SUBSTRATES WITH SEVERAL METALLIZATION PLANES

Helmut Schettler, Dettenhausen, and Ewald Stadler, Herrenberg-Kuppingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,095
Claims priority, application European Pat. Off., Dec. 23, 1981, 81110713.5
Int. Cl.⁴ H05K *1/18*
U.S. Cl. 361—406 **4 Claims**



1. A ceramic substrate for mounting integrated circuit semiconductor devices, the substrate having holes therethrough with lead pins mounted therein and having at least two patterned metallization layers, wherein increased density is achieved while eliminating capacitive and inductive coupling comprising:

a first metallization layer on the top surface of said substrate including a plurality of closely spaced pads provided to make contact to I/O pads on said device mounted on said substrate and a plurality of signal conductors connected to and emanating from said closely spaced pads and connected to said lead pins mounted on said substrate;

a second shielding metallization layer on the top surface of said substrate comprised of a plurality of electrically interconnected first loops said first loops including metal stripe portions located laterally of said signal conductors of said first metallization layer and in conforming relationship and second interconnected loops disposed about and in spaced relation to said lead pins and

a layer of insulating material disposed between said first and second metallization layers.

4,551,790

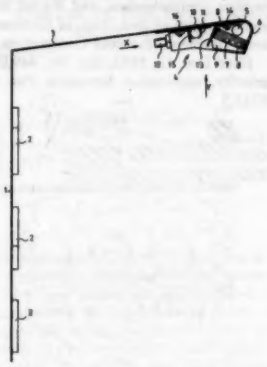
LIGHT RAMP FOR LIGHTING INSTRUMENT PANELS, MORE ESPECIALLY IN AIRCRAFT OR HELICOPTER

Jean Benquey, and Louisa F. Benquey, both of Rabastens De Bigorre, France, assignors to Societe d'Exploitation du Laboratoire Abadie, Vic En Bigorre, France

Filed Jun. 13, 1983, Ser. No. 503,495
Claims priority, application France, Apr. 20, 1983, 83 06502
Int. Cl.⁴ G01D *11/28*
U.S. Cl. 362—23 **3 Claims**

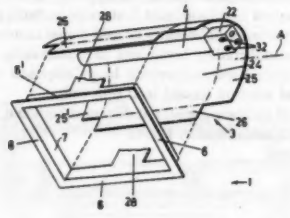
1. A light ramp for lighting instrument panels comprising a frame disposed in front of said panel, at least one fluorescent tube mounted to said frame for emitting ultra-violet light toward said panel, a filter plate sealingly fixed to said frame and extending between said panel and said fluorescent tube for

filtering a portion of said ultra-violet light, and an additional fluorescent tube mounted to said frame in a spaced relation to



said one fluorescent tube for emitting additional unfiltered light towards said panel.

4,551,791
RECESSED LAMP
Werner Salansky, Vienna, Austria, assignor to Stabeg Apparatebaugesellschaft m.b.H., Vienna, Austria
Filed May 31, 1984, Ser. No. 616,006
Int. Cl.[4] F21V *7/18*
U.S. Cl. 362—296 **10 Claims**



1. A lamp adapted to be mounted in a hole in a wall, the lamp comprising:

an outer frame fittable in the hole;

means for securing the frame snugly in the hole bearing inward against the wall;

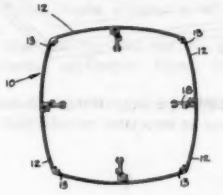
a generally part-cylindrical reflector engaged snugly inside the frame, extending along an axis, and having a pair of axially open ends bearing outward against the outer frame and extending axially past the opening, the reflector being of limitedly elastically flexible sheet metal and of U-section and having axially extending edges provided with tabs engaging outward into the outer frame;

a socket for a bulb at one of the ends of the reflector and wholly hidden by the frame;

a terminal box on the securing means; and

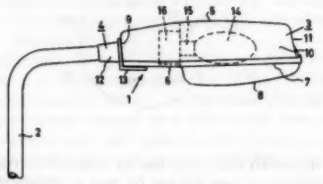
a flexible electric wire extending between the box and the socket.

4,551,792
EXTERIOR POST TOP MOUNTING LIGHTING FIXTURE
Merle C. Hoke; Richard G. Armstrong, both of Newark, and James E. Penn, Lockbourne, all of Ohio, assignors to Manville Service Corp., Denver, Colo.
Filed Sep. 16, 1983, Ser. No. 533,326
Int. Cl.[4] B60Q *3/04*
U.S. Cl. 362—362 **7 Claims**



1. A light fixture for exterior post top mounting having a housing comprising four identical right-angled extruded aluminum members with interlocking joints for holding each other to form a solid rigid housing.

4,551,793
ROAD ILLUMINATION LUMINAIRE FOR POLE-MOUNTING
Sybe J. Mellema, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 416,839, Sep. 13, 1982, abandoned. This application May 31, 1984, Ser. No. 616,777
Claims priority, application Netherlands, Oct. 29, 1981, 8104892
Int. Cl.[4] F21S *1/10*
U.S. Cl. 362—370 **1 Claim**



1. A road illumination luminaire for mounting on an associated pole which comprises: a housing having a lower wall in which a light-emanating window is present, an upper wall, and side walls; said housing having an aperture in said lower wall and an aperture in one of said side walls, each aperture being dimensioned and configured for cooperation with the end of the associated pole with one of said apertures facing a pole end; means to fix said luminaire to the associated pole, said means comprising a unitary cover member and a sleeve extending from said cover member for receiving therein the end of the associated pole, said sleeve and said cover member having substantially aligned bores extending through them, said cover member being secured against the outside of said housing of said luminaire, said cover member extending over both said aperture in said lower wall and said aperture in said side wall, said cover member being securable to said housing with said aligned bores substantially aligned with one of said apertures, the outer surface of said lower wall and the outer surface of said one side wall at respective areas where said cover member is securable against said housing are at an external angle of 255° to 270° to each other and said sleeve extends substantially perpendicularly to one of said outer surfaces, the connection of said lower wall to said one side wall of said housing in the

region of said cover member is defined by an inclined face which is inclined with respect to each of said outer surfaces, said cover member having a corresponding inclined face through which said means is secured to said housing by means of a bolt.

4,551,794

IMITATION CANDLE WITH MAGNETIC PENDULUM

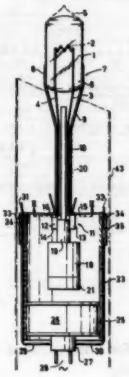
Sven Sandell, Kälkbacksgatan 5, Jönköping, Sweden

Filed Sep. 19, 1984, Ser. No. 652,032

Claims priority, application Sweden, Sep. 21, 1983, 8305081

Int. Cl.⁴ F21V *23/00*

U.S. Cl. 362—392 **5 Claims**



1. An imitation candle which comprises an elongated outer candle-like casing having located at one end thereof an electric light bulb (1) which is attached to one end of a pendulum and which is balanced by a counterweight (18) made totally or partially of a magnetic material and attached to the opposite end of said pendulum, said pendulum being pivotally mounted on pivot suspension means (15; 36) at a location between the two ends of said pendulum, and which further comprises an electromagnet (25) which is placed beneath the counterweight (18) and which is arranged to receive periodically an electric current so as to generate an electromagnetic field acting upon the counterweight, characterized in that said pivoting means comprises two wire-like elements (15, 36) which extend in a mutually common plane in mutually opposite directions from a common connector (11) on said pendulum, and the ends (33,34; 37) of said elements remote from the pendulum are firmly attached to a holder (23) surrounding the pendulum; and in that the counterweight (18) is supported by or consists of a permanent magnet (21) with the north pole and the south pole thereof lying on a line extending substantially at right angles to the longitudinal axis of the pendulum.

4,551,795

APPARATUS FOR USE IN MONITORING A PLURALITY OF VARIABLE PARAMETERS

John H. Fisher, Royston, and Frank Ferdinandi, Linton, both of England, assignors to Precision Grinding Limited, Mitcham Junction, England

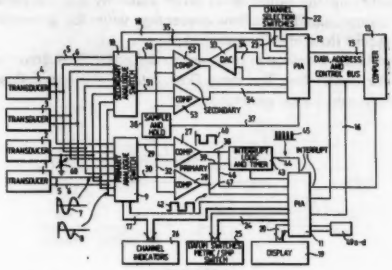
Filed Feb. 22, 1983, Ser. No. 468,845

Claims priority, application United Kingdom, Feb. 24, 1982, 8205480

Int. Cl.⁴ G05B *9/02*; G06F *15/46*; G01C *25/00*

U.S. Cl. 364—139 **3 Claims**

1. Apparatus for use in monitoring a plurality of variable parameters, said apparatus including a plurality of transducers, means including each transducer for detecting a variation in a respective parameter and for providing two out-of-phase elelctrical output signals representative of said respective parameter, first and second analog switches, means for applying the two out-of-phase signals from each of the transducers to each of the first and second analog switches, a gating circuit, means for coupling the first analog switch to the gating circuit for transmitting signals related to the output of a respective transducer, display means, means for applying signals derived from the output of the gating circuit to the display means in order to display an output which is representative of a parameter being



monitored, a computer, adapter means coupled to the computer and to the second analog switch for causing the second analog switch to scan the outputs from each of the transducers and to detect any change in an output from a transducer, storage means for storing a respective signal to be displayed, and means under the control of the computer for causing the contents of the storage means to be changed according to any change in an output from a transducer which is detected by the second analog switch.

4,551,796

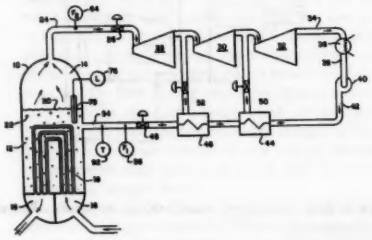
LIQUID LEVEL CONTROL SYSTEM FOR VAPOR GENERATOR

Gurdip Singh, Windsor Locks, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 3, 1983, Ser. No. 500,759

Int. Cl.⁴ G05B *15/02*; H02P *9/04*; F01B *25/00*; F02N *11/06*

U.S. Cl. 364—148 **7 Claims**



1. A method for controlling a flowing liquid entering a vapor generator, the entering liquid having a mass flow rate and a current temperature, and the vapor generator having a current level of liquid therewithin, a flow of a vapor exiting therefrom, including a mass flow rate of the vapor, a rate of liquid mass accumulation or depletion within said vapor generator, and a difference between the entering and exiting mass flow rates, comprising the steps of:

measuring the current level of liquid in said vapor generator;

comparing the measured liquid level with a reference level for generating a liquid level error value;

determining the rate of mass accumulation or depletion within said vapor generator;

measuring the current temperature of the entering liquid;

generating a temperature gain value, responsive to the incoming liquid temperature, said gain value having a value of unity for measured liquid temperatures greater than or equal to a reference temperature and increasing linearly with decreasing measured liquid temperatures below the reference temperature;

multiplying the determined rate of mass accumulation or depletion by said temperature gain value for generating a temperature compensated mass flow correction value;

modifying the liquid level error value by the temperature compensated mass flow correction value for generating a liquid flow error value; and

regulating a device in response to the liquid flow error value for controlling the mass flow rate of the liquid flowing into said vapor generator.

4,551,797

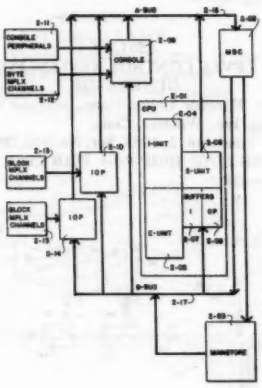
APPARATUS FOR REVERSE TRANSLATION

Gene M. Amdahl, Atherton; Donald L. Hanson, Los Altos Hills; Ronald K. Kreuzenstein, Sunnyvale; Gwynne L. Roshon-Larsen, Saratoga, and Gary A. Woffinden, Scotts Valley, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 3, 1983, Ser. No. 528,091

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **17 Claims**



1. In a data processing machine, an apparatus for storing data, comprising:

a primary storage means for storing data;

primary addressing means for uniquely addressing said data with unique primary addresses;

secondary storage means for storing data in communication with said primary storge means so that data may be transferred between said primary storage means and said secondary storage means,

secondary addressing means for addressing said secondary storage means with secondary addresses;

forward translation means for translating said secondary addresses to said unique primary addresses to uniquely address said data; and

reverse translation means for translating said unique primary addresses to synonym secondary addresses which translate to said unique primary addresses.

4,551,798

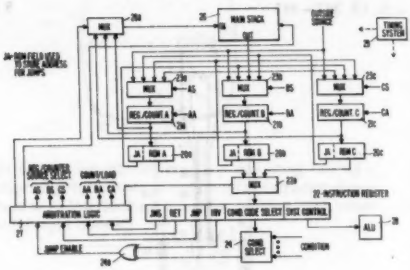
MULTIPLE CONTROL STORES IN A PIPELINED MICROCONTROLLER FOR HANDLING NESTER SUBROUTINES

Carlos F. Horvath, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 3, 1982, Ser. No. 438,703

Int. Cl.[4] G06F *9/32, 9/42*

U.S. Cl. 364—200 **13 Claims**



1. A microcontroller for controlling a digital device, said microcontroller comprising:

a plurality of control memories each for storing a set of microinstructions, each microinstruction being formed of a control field for controlling said digital device, a jump address field specifying the location in other control memory of the next microinstruction to be executed should said each microinstruction be a jump to subroutine or return from subroutine instruction and an instruction field specifying whether that particular microinstruction is a jump microinstruction, return microinstruction, or requires neither action:

a plurality of address registers one for each control memory and containing the address of the next microinstruction to be fetched;

means for fetching said microinstructions from each of said control memories in every clock cycle;

an instruction register coupled to the respective memories and digital device for receiving the control field and instruction field of a microinstruction fetched from one of said control memories;

a multiplexor coupled between said instruction register to select the instruction field and control field of one of the microinstructions being fetched from said respective control memories;

interconnection means coupled between each of said control memories and the address registers of the other control memories for supplying a jump address to the address registers of the other control memories;

logic means coupled to said instruction field portion of said instruction register and to said address registers specifying one of said registers as a program counter and one of said address registers as a return from subroutine register;

means responsive to said logic means to increment said program counter and to keep said return from subroutine register current contents; and

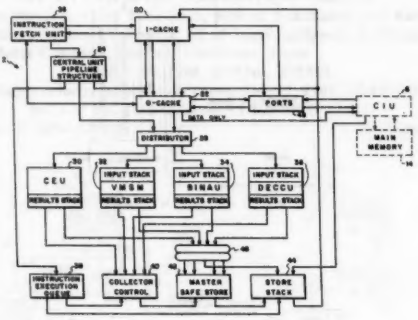
push-down stack means coupled to said plurality of address registers to receive one or more return from subroutine addresses in a first-in last-out manner to accommodate the execution of a series of nested subroutines.

4,551,799

VERIFICATION OF REAL PAGE NUMBERS OF STACK STORED PREFETCHED INSTRUCTIONS FROM INSTRUCTION CACHE

Charles P. Ryan, Phoenix, and Russell W. Guenthner, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Feb. 28, 1983, Ser. No. 470,125
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 2 Claims



1. In a digital data processing system having a synchronous central processor, said central processor including central execution pipeline means for initiating the execution of instructions including transfer instructions, each instruction having a physical address which includes a real page number; a cache; and instruction fetch means for prefetching instructions from the cache and for storing prefetched instructions awaiting execution in an instruction stack; said central execution pipeline means initiating the execution of instructions obtained from the instruction stack of the instruction fetch means in a number of steps, one step of which includes obtaining of the real page number of the instruction passing through said one step; the improvements comprising:

first random access memory means of the cache said first memory means having addressable storage locations for storing instructions;

random access directory means having addressable storage locations, the addresses of which correlate with addressable storage locations of said first memory means, the storage locations of the directory means storing the real page number of the instruction stored in correlative storage locations in the first memory means;

second stack means for storing the real page number stored in the directory for each instruction fetched from the first memory means of the cache by the instruction fetch means;

register means for storing the real page number of the target instruction of the most recently fully executed transfer instruction; and

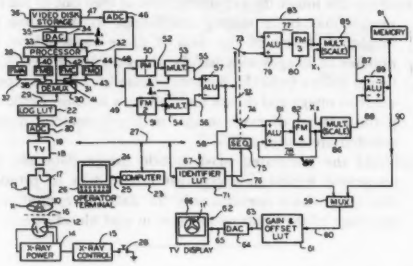
means for comparing the real page number stored in said register means with the real page number of the instruction in execution obtained from said second stack means for the same instructions, the failure of the two real page numbers to compare identifying that the instruction in execution was improperly fetched from the first random access memory means of the cache.

4,551,800

INTEGRATED HYBRID IMAGE REMASKING IN A SUBTRACTION ANGIOGRAPHY METHOD

Stephen J. Riederer, Wauwatosa, and Gary S. Keyes, Hartland, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,954
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 12 Claims



1. An integrated remasking method of producing data representative of an x-ray image of a blood vessel in a region of a body in a subtraction angiography procedure, the method comprising the following steps:

repeatedly expose said body region containing said vessel to a low energy x-ray beam and a high energy x-ray beam in pairs and in either order during at least one of two periods, namely, a pre-contrast period when an x-ray contrast medium that has been introduced into said body has not yet arrived in said vessel and a period during which said medium has departed from said vessel, said periods being defined as non-contrast periods and the resulting images as non-contrast images, and maintaining said exposures during an intervening period when said medium is present in said vessel defined as the post-contrast period and the resulting images as the post-contrast images,

convert the sequence of non-contrast and post-contrast x-ray images thus produced at high and low energy to data representative of the images,

select the data for one of the low energy exposure images obtained during a non-contrast period as the low energy mask image data and select the data for one of the high energy exposure images obtained during a non-contrast period as the high energy mask image data,

subtract the low energy mask image data from the respective data for the low energy exposure images in the sequence and subtract the high energy mask image data from the data for the high energy exposure images in the sequence to thereby provide a series of low energy temporal difference images data and a series of high energy temporal difference images data,

perform energy subtraction comprising multiplying each of said low energy temporal difference images data, respectively, by a weighting coefficient and multiply each of said high energy temporal difference image data next to the low energy temporal difference image data in the series respectively by a different weighting coefficient and subtract the low energy temporal difference image from the high energy temporal difference image data, respectively, to thereby provide a series of first order hybrid difference images data extending over at least one of the non-contrast periods and over the post-contrast period,

display one after another of the images that correspond to the first order hybrid difference images data and observe the images for identifying and selecting those first order hybrid non-contrast images that are of suitable quality to be used for forming new integrated mask image data and those post-contrast images that have contrast medium in

them and are suitable for forming new integrated post-contrast image data,

integrate the sequence of first order hybrid difference images data corresponding to the hybrid difference images that have been identified as usable to form the new mask image data and separately integrate the sequence of hybrid difference images data corresponding to the hybrid difference images that have been identified as usable to form new post-contrast image data,

multiply the image data resulting from at least one of the two integrations by a scaling coefficient to normalize the brightness levels of the data in those cases where the number of images selected for the new integrated mask image differs from the number selected for the new post-contrast image and do not multiply by a scaling coefficient if the number of mask images and post-contrast images selected are equal, and

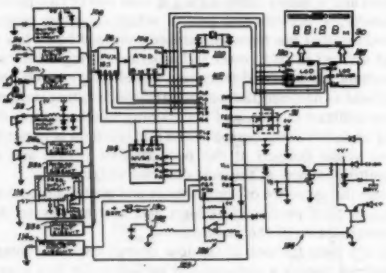
subtract the integrated mask hybrid image data and the integrated hybrid post-contrast image data to produce final data which contains only the data representative of an image of the contrast medium in said blood vessel.

4,551,801

MODULAR VEHICULAR MONITORING SYSTEM

David G. Sokol, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Feb. 7, 1983, Ser. No. 464,220
Int. Cl.[4] G06F *15/20;* A01D *41/00*
U.S. Cl. 364—424 24 Claims



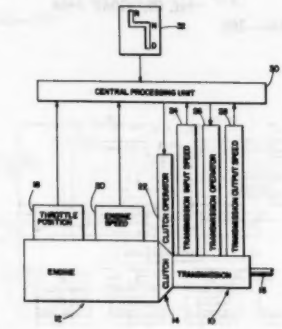
1. A monitoring system for monitoring a plurality of functions and conditions of a vehicle, said vehicle including a plurality of sensors for producing sensor signals in response to said plurality of functions and conditions, said monitoring system comprising: a plurality of identical monitoring modules, each comprising a plurality of input means each for receiving a selected one of said sensor signals, said plurality of input means being fewer in number than said plurality of sensors, processing means responsive to said sensor signals at said input means for producing display signals corresponding to the associated functions and conditions in accordance with said sensor signals, and memory means for storing data and instructions for enabling said processing means to respond to the sensor signals from any of said sensor means for monitoring any of said corresponding functions and conditions; and sensor identifying means associated with each of said modules for producing sensor identifying signals to identify the particular sensors coupled to said input means; said processing means being coupled to receive said sensor identifying signals from the associated sensor identifying means and responsive thereto for selecting from said memory means only those data and instructions for monitoring said corresponding functions and conditions, whereby said plurality of said monitoring modules are capable of monitoring all of said plurality of vehicle functions and conditions.

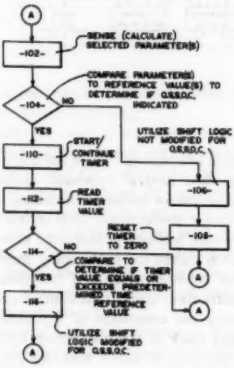
4,551,802

AUTOMATIC TRANSMISSION CONTROL METHOD

Robert R. Smyth, Bloomfield Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 17, 1982, Ser. No. 442,474
Int. Cl.[4] B60K *41/08;* G06F *15/20*
U.S. Cl. 364—424.1 22 Claims




SENSE (CALCULATE) SELECTED PARAMETER(S)
COMPARE PARAMETER(S) TO REFERENCE VALUE(S) TO DETERMINE IF O.S.S.O.C. INDICATED
NO
YES
START/ CONTINUE TIMER
UTILIZE SHIFT LOGIC NOT MODIFIED FOR O.S.S.O.C.
READ TIMER VALUE
RESET TIMER TO ZERO
COMPARE TO DETERMINE IF TIMER VALUE EQUALS OR EXCEEDS PREDETERMINED TIME REFERENCE VALUE
UTILIZE SHIFT LOGIC MODIFIED FOR O.S.S.O.C.

1. An improved method for controlling an automatic transmission system for devices having a throttle-controlled engine, an operator actuated throttling control means and a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft, said transmission input shaft being operatively connected to said engine, said transmission system comprising, an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the position of said throttle controlling means and (2) an input signal indicative of the rotational speed of said engine, said processing unit including means for processing said input signals in accordance with a program to provide a predetermined gear ratio for a given combination of input signals and for generating output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission effective to actuate said transmission to effect engagement of one of said gear ratio combinations in response to said output signals from said processing unit, the improved method comprising:

sensing the presence or absence of operator selected stable operation of the device by causing said processing unit to process at least one of said input signals in accordance with predetermined logic rules; and,

modifying said program by lowering the engine speed at

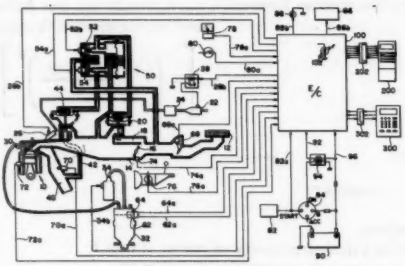
which an upshift will be commanded in response to said processing unit sensing the presence of operator selected stable operation of the device.

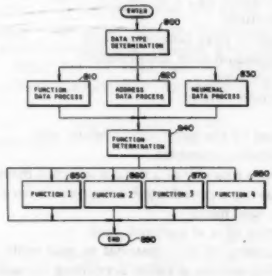
4,551,803

ELECTRONIC ENGINE CONTROL SYSTEM FOR CONTROLLING THE ENERGY CONVERSION PROCESS OF AN INTERNAL COMBUSTION ENGINE

Akio Hosaka; Akito Yamamoto, both of Yokohama, and Katsunori Oshiage, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 15, 1982, Ser. No. 398,554
Claims priority, application Japan, Jul. 17, 1981, 56-110887
Int. Cl.⁴ F02B *3/00;* **G05B** *15/02;* **F02D** *37/00*
U.S. Cl. 364—431.05 **3 Claims**





1. An apparatus for controlling the energy conversion process of an internal combustion engine, comprising:

means for controlling the energy conversion process;

sources for providing signals indicative of engine operating parameters;

a data input unit having a keyboard input device for providing data specifying a function to be performed, a memory location, and a numeral; and

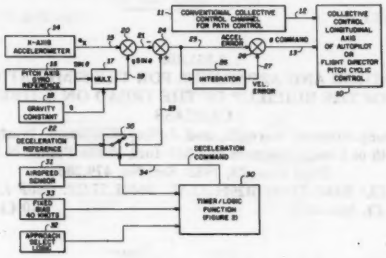
a digital computer having a memory for storing coefficients in respective locations, the digital computer using the signals from the sources and the coefficients stored in the memory for calculating settings of the means for controlling the energy conversion process, the digital computer being connected to receive said data from the data input unit and being programmed to perform said specified function using said specified numeral and said specified memory location, said specified function including modifying a coefficient stored in the memory at the specified location based upon the specified numeral.

4,551,804

APPROACH TO HOVER CONTROL SYSTEM FOR HELICOPTERS

Thomas R. Clark, Peoria, and Carl D. Griffith, Phoenix, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 8, 1983, Ser. No. 464,825
Int. Cl.⁴ G06F *15/50;* **B64C** *11/44*
U.S. Cl. 364—434 **9 Claims**



1. A pitch axis control system for controlling a deceleration maneuver of a helicopter from an initial airspeed to a hover condition comprising

(a) means for providing a first time measure proportional to the time required to decelerate from said initial airspeed to an airspeed intermediate said initial airspeed and hover,

(b) means responsive to said first time measure for providing a second time measure proportional to the predicted time required to decelerate from said intermediate airspeed to hover,

(c) means for providing a third time measure proportional to the time during which said helicopter is actually decelerating between said intermediate airspeed and hover,

(d) first comparator means for comparing said second and third time measures, and

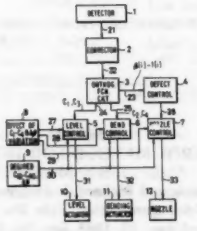
(e) means responsive to said first comparator means for terminating said deceleration maneuver when said second and third time measures become equal.

4,551,805

CONTROL SYSTEM FOR STRIP CONFIGURATION

Michio Shimoda, and Fumio Watanabe, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP81/00285, § 371 Date Jun. 21, 1982, § 102(e) Date Jun. 21, 1982, PCT Pub. No. WO82/01485, PCT Pub. Date May 13, 1982
PCT Filed Oct. 15, 1981, Ser. No. 395,069
Claims priority, application Japan, Oct. 30, 1980, 55-153165
Int. Cl.⁴ G06F *15/46;* **B21B** *37/00*
U.S. Cl. 364—469 **4 Claims**



1. A configuration control system for the fabrication of a strip material, comprising:

detecting means for detecting a configuration pattern of said strip material at a plurality of positions on said strip material;

means for converting said detected configuration pattern to coefficients multiplying orthogonal polynomials, said coefficients and polynomials forming series representation of said configuration pattern, said series containing at least four polynomials; and

means for controlling the fabrication of said strip material by the values of at least one of said coefficients.

4,551,806

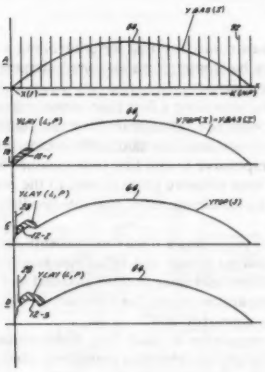
METHOD AND APPARATUS FOR THE SIMULATION OF THE BUILD UP OF THE TREAD ON A TIRE CARCASS

Anthony Storace, Norwalk, and Jeffery Ketchman, Westport, both of Conn., assignors to AMF Inc., White Plains, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,286

Int. Cl.[4] B31C *81/00*; B29H *17/02*; B65H *57/28*; G06F *15/46*

U.S. Cl. 364—473 **40 Claims**



1. A method for simulating the manner in which a ribbon of known profile is wrapped around a carcass of known profile in accordance with a predetermined winding specification, said method comprising the steps of:

storing the profile of said ribbon, the profile of said carcass, and said winding specification in a memory;

calculating, for at least one cross-section of said carcass, the profile of a final ribbon build which will be created at said cross-section when said ribbon is wrapped around said carcass in accordance with said winding specification, said calculating step being performed as a function of said profile of said carcass, said ribbon profile and said winding specification; and

displaying, for each of said cross-sections, said profile of said final ribbon build.

4,551,807

CURE-CONTROL METHOD FOR THERMOSETTING POLYMERIC MATERIAL

Henry S. Y. Hsich, and Richard J. Ambrose, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Aug. 17, 1983, Ser. No. 523,863

Int. Cl.[4] G06F *15/46*; B29H *5/02*

U.S. Cl. 364—473 **11 Claims**

1. A method for producing cured rubber material with a desired property, said method including the steps of establishing a desired property for the cured material according to the equation:

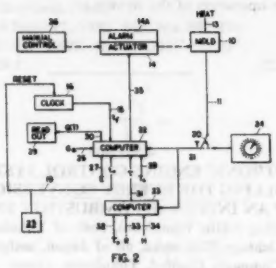


FIG. 2

$$G(t) = G_e \exp\left[\frac{E}{RT(t)}\right] + \left[G_\infty - G_e \exp\left(\frac{E}{RT_C}\right)\right]\left\{1 - \exp\left[-\left(\int_{t_0}^{t_f} \frac{d(t-t_0)}{\tau}\right)^{\beta}\right]\right\}$$

where:

$$\tau = \tau_0(H/RT)$$

and where:

G(t) is a desired property of rubber at time t;

G_e is a constant representing the property;

E is an activation energy for viscous flow;

H is an activation energy for cure reaction;

R is a gas constant, i.e., 1.98 cal./°K.-mole;

T is a temperature;

G_∞ is a property after complete cure;

T_C is an equilibrium cure temperature;

t_f is a final cure time;

t_0 is an induction time at T_C;

t is a time;

τ_0 is a constant of the polymeric system; and

β is a filler loading constant,

introducing into a cavity of a mold a selected mass of rubber material having a preselected composition for curing said material in said mold,

initiating curing of said material, and

terminating curing of said material in said mold when the quantity G(t) attains a value according to said equation corresponding to the desired property by said step of establishing.

4,551,808

TOOL WEAR SENSORS

Stanley K. Smith, and Donald J. Rozsi, both of Fenton, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 30, 1983, Ser. No. 480,564

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—474 **23 Claims**

1. A method of applying variable torque to drive a tool and monitoring the performance of the tool which moves relative to a workpiece through a cycle by monitoring the variable torque applied to the tool comprising the steps of:

dividing said cycle into a plurality of increments;

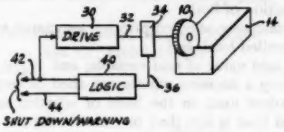
sensing the variable torque applied to said tool during at least some of said increments;

determining and storing the highest sensed torque applied to said tool during at least some of said increments;

determining and storing the lowest sensed torque applied to said workpiece during at least some of said increments;

setting a maximum differential torque limit for the difference between the highest torque and lowest torque sensed during at least one particular increment;

calculating the torque differential between the highest torque and lowest torque sensed during said one particular increment; and



comparing said calculated torque differential between the highest torque and the lowest torque sensed for said particular increment with said set maximum differential torque limit for said pariticular increment and establishing a first signal when said calculated torque differential exceeds said maximum differential torque limit.

4,551,809

APPARATUS AND METHOD FOR MONITORING THE MACHINING CONDITIONS OF AN EDM APPARATUS

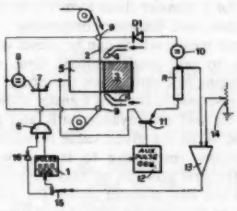
Georges-André Marendaz, Meyrin, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Jun. 21, 1983, Ser. No. 506,308

Claims priority, application Switzerland, Jun. 23, 1982, 3840/82

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—474 **8 Claims**



1. A method for monitoring machining conditions in the course of electrical discharge machining of an electrode workpiece by means of a travelling wire electrode wherein a machining fluid is applied to a machining zone between the electrode workpiece and the wire electrode, said method comprising measuring the resistivity of the machining fluid during time intervals between consecutive electrical discharges, detecting through said resistivity measurements an increase of resistivity of said machining fluid, and providing a signal in response to said increase of resistivity as an indication of machining condition deterioration.

4,551,810

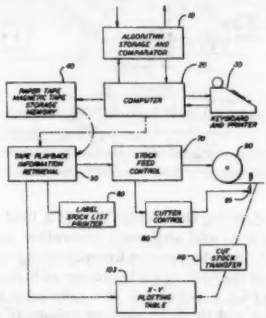
METHOD AND APPARATUS FOR DESIGNING DUCT WORK AND FOR PRODUCING PATTERNS FOR CONDUIT SECTIONS IN THE DESIGNED DUCT WORK

Richard W. Levine, Dobbs Ferry, N.Y., assignor to Construction Technology, Inc., Elmsford, N.Y.

Continuation-in-part of Ser. No. 503,699, Jun. 13, 1983, , which is a continuation-in-part of Ser. No. 402,607, Jul. 28, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,648

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—475 **23 Claims**



11. In a method for automatically producing patterns for the sides of a three dimensional product which can be fabricated from sheet material, such as a ventilating duct fitting, said patterns being produced in response to the inputting of actual dimensional and pattern type data relating to said product, the improvement comprising the steps of:

storing, in digital form in memory means, configurations and dimensional requirements of basic product types from which all possible variations of the three-dimensional product may be produced;

entering input data into a computer operatively connected to said memory means, said input data including product type and dimensions of said product, the entered dimensions corresponding to dimensional requirements, stored in said memory means, of the product type entered; electronically deriving in said computer actual dimensional and pattern type data for each side of said product from the entered product type and dimensions of said product;

storing in said memory means said actual dimensional and pattern type data; and producing patterns for the sides of said product in response to said actual dimensional and pattern type data stored in said memory means.

4,551,811

GROUND DETECTION ARRANGEMENT FOR AN A.C. GENERATOR

Ryosuke Taniguti, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 4, 1982, Ser. No. 405,281

Claims priority, application Japan, Aug. 7, 1981, 56-124882

Int. Cl.⁴ G06G *7/62*; G08B *21/00*

U.S. Cl. 364—481 **7 Claims**

1. A ground detection arrangement for an A.C. generator comprising:

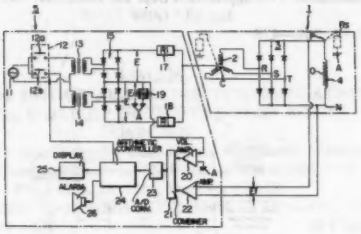
resistors (R_i) of high resistance connected to a neutral point of an armature winding of the A.C. generator;

a voltage source of positive and negative D.C. voltages (+E) and (−E) alternately applied to the neutral point of said armature winding through said resistors (R_i);

a detecting resistor (R_d) connected between the D.C. voltage source and the ground of the circuit arrangement;

an arithmetic controller connected to receive detected voltages developed across said detecting resistor (R_d) when

the respective positive and negative D.C. voltages (+E) and (−E) are applied, and including means for calculating a ground resistance (R_x) on the basis of a sum of absolute values of both the detected voltages (E_{d+}) and (E_{d-}) and said D.C. voltages (+E) and (−E) and said resistors (R_f) and (R_d) and for comparing the calculated result for ground resistance (R_x) with a reference resistance value;



means for deriving the voltage (E_f) of a field winding and applying it to said airthmetic controller, said arithmetic controller including means for calculating a ground position (L) on the basis of a relative sum of both said detected voltages (E_{d+}) and (E_{d-}), the calculated ground resistance (R_x), and the field winding voltage (E_f); and

a display device to display the calculated ground resistance (R_x) and the actual ground position based on the calculated ground position (L).

4,551,812

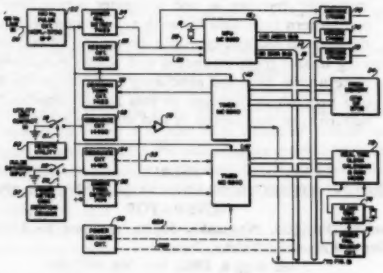
ENERGY CONTROLLER AND METHOD FOR DYNAMIC ALLOCATION OF PRIORITIES OF CONTROLLED LOAD CURTAILMENT TO ENSURE ADEQUATE LOAD SHARING

George P. Gurr, and Frederick A. Matheson, both of Phoenix, Ariz., assignors to Cyborex Laboratories, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 274,488, Jun. 17, 1981, Pat. No. 4,464,724. This application Sep. 20, 1982, Ser. No. 420,563

Int. Cl.⁴ G06F *15/56*; H02J *3/14*

U.S. Cl. 364—492 **32 Claims**



1. A method for controlling delivery of elecrical energy from a power line to an establishment having a plurality of electrical loads in order to maintain the total power delivered to the electrical loads close to a power limit, the electrical loads including a plurality of controlled loads which can be electrically connected to and disconnected from the power line, partially in accordance with user-selected priorities attributed to respect ones of the controlled loads, by means of a control system, the control system including a plurality of load switching means for controllably connecting the controlled loads to and disconnecting the controlled loads from the power line, the control system also including power measuring means for measuring power delivered from the power line to the electrical loads, said method comprising operating a processor to effect the steps of:

(a) for each of said controlled loads, including a first one of said controlled loads,

1. measuring the value of a variable associated with a cumulative effect of operation or non-operation of that controlled load.

2. computing a cumulative priority value for that controlled load, said cumulative priority value being a function of both

(i) said user-selected priority associated with that controlled load, and

(ii) said value of said variable; and

(b) making a decision whether to shed or restore said first controlled load on the basis of whether said first controlled load is less than or exceeds the the value of said cumulative priority value of certain other cumulative priority values of other ones of said controlled loads.

4,551,813

JAM DETECTOR

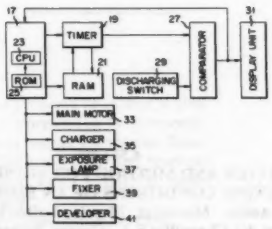
Takeshi Sanbayashi, and Hiroshi Matsumoto, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 8, 1982, Ser. No. 439,985

Claims priority, application Japan, Nov. 30, 1981, 56-192018

Int. Cl.⁴ B65H *7/02*

U.S. Cl. 364—569 **4 Claims**



1. A jam detector, used in a sheet transfer device, for performing jam detection of first and second transfer sheets on a conveyance path between a first position and a second position by comparing the conveying times of the first transfer sheet and the subsequent second transfer sheet with a predetermined time needed for a transfer sheet to move between the first and second positions, said detector comprising:

a single timer means which can be preset with a value corresponding to said predetermined time, said single timer means begins to count down the preset value to a given value in response to the first transfer sheet passing the first position on said conveyance path, and generates a time-out signal when the given value is reached;

memory means, responsive to the second transfer sheet passing the first position on said conveyance path subsequent to the first transfer sheet, for storing data corresponding to that count value of said timer means which is obtained when the second transfer sheet passes the first position;

detection means for detecting the first transfer sheet at the second position and generating a detection signal;

first judging means for detecting, in response to the detection signal from said detection mens, whether or not the time-out signal is generated and for judging that a paper jam has occurred when it is detected that the time-out signal is generated; and

second judging means for reading the data stored in said memory means, when said first judging means determines that no paper jam has occurred, for computing a preset value for the second transfer sheet based on the read-out

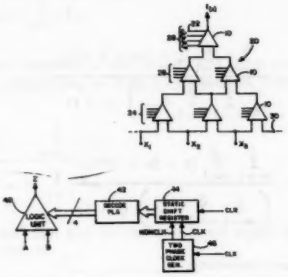
data, for setting said timer means with the computed value, and for permitting said timer to count down.

4,551,814

FUNCTIONALLY REDUNDANT LOGIC NETWORK ARCHITECTURES

Donald W. Moore, and Rick A. Verstraete, both of Los Angeles, Calif., assignors to Aerojet-General Corporation, La Jolla, Calif.

Filed Dec. 12, 1983, Ser. No. 560,109
Int. Cl.[4] H03K *19/003*
U.S. Cl. 364—716 **19 Claims**



1. A logic gate structure having a plurality of data input variables and comprising:

a hierarchial array of multi-variable input gates, at least one such gate having a plurality of gate control input lines for selecting operation of said gate in accordance with any one of a plurality of possible Boolean logic functions for the number of data input variables; said gates comprising:

a plurality of memory devices, at least one such memory device being associated respectively with each such gate and being connected to said gate control input lines for selecting said gate operation;

register means being associated respectively with each such memory device for sequentially selecting the output of said memory devices for application to said gate control lines; and

means for activating said register means for applying selected binary signals from said memory devices to said gates for presenting a selected Boolean logic function to said data input variables.

4,551,815

FUNCTIONALLY REDUNDANT LOGIC NETWORK ARCHITECTURES WITH LOGIC SELECTION MEANS

Donald W. Moore, and Rick A. Verstraete, both of Los Angeles, Calif., assignors to Aerojet-General Corporation, La Jolla, Calif.

Continuation-in-part of Ser. No. 560,109, Dec. 12, 1983,. This application Mar. 15, 1984, Ser. No. 589,943
Int. Cl.[4] H03K *19/003*
U.S. Cl. 364—716 **18 Claims**

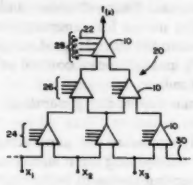
1. A programmable logic gate structure having a plurality of data input variables and comprising:

a hierarchical array of multi-variable input gates at least one such gate having a plurality of gate control input lines for selecting operation of said gate in accordance with any one of a plurality of possible Boolean logic functions for the number of data input variables; said gates comprising:

a plurality of memory devices, at least one such memory device being associated respectively with each such gate and being connected to said gate control input lines for selecting said gate operation;

register means being associated respectively with each such memory device for sequentially selecting the output of said memory devices for application to said gate control lines;

means for activating said register means for applying selected binary signals from said memory devices to said



gates for presenting a selected Boolean logic function to said data input variables; and

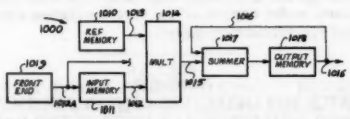
means for generating said selected binary signals in response to a functional expression of said selected Boolean logic function.

4,551,816

FILTER DISPLAY SYSTEM

Gilbert P. Hyatt, P.O. Box 846, Cypress, Calif. 90630

Continuation-in-part of Ser. No. 160,872, Jun. 19, 1980, Pat. No. 4,491,930, Ser. No. 860,257, Dec. 14, 1977, Pat. No. 4,371,923, and Ser. No. 849,733, Nov. 9, 1977, abandoned, said Ser. No. 160,872, is a continuation-in-part of Ser. No. 899,301, Mar. 23, 1978, Pat. No. 4,322,819, Ser. No. 860,278, Dec. 13, 1977, Pat. No. 4,471,385, Ser. No. 849,812, Nov. 9, 1977, Ser. No. 844,765, Oct. 25, 1977, Ser. No. 812,285, Jul. 1, 1977, Pat. No. 4,371,953, Ser. No. 801,879, May 13, 1977, Pat. No. 4,144,582, Ser. No. 754,660, Dec. 27, 1976, Pat. No. 4,486,850, Ser. No. 752,240, Dec. 20, 1976, abandoned, Ser. No. 730,756, Oct. 7, 1976, abandoned, Ser. No. 727,330, Sep. 27, 1976, abandoned, Ser. No. 550,231, Feb. 14, 1975, Pat. No. 4,209,843, Ser. No. 522,559, Nov. 11, 1974, Pat. No. 4,209,852, Ser. No. 490,816, Jul. 22, 1974, Pat. No. 4,209,853, Ser. No. 476,743, Jun. 5, 1974, Pat. No. 4,364,110, Ser. No. 402,520, Oct. 1, 1973, Ser. No. 366,741, Jun. 4, 1973, Pat. No. 3,986,922, Ser. No. 339,817, Mar. 9, 1973, Pat. No. 4,034,276, Ser. No. 325,941, Jan. 22, 1973, Pat. No. 4,060,848, Ser. No. 325,933, Jan. 22, 1973, Pat. No. 4,016,540, Ser. No. 302,771, Nov. 1, 1972, , Ser. No. 291,394, Sep. 22, 1972, Pat. No. 4,396,976, Ser. No. 288,247, Sep. 11, 1972, Pat. No. 4,121,284, Ser. No. 246,867, Apr. 24, 1972, Pat. No. 4,310,878, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, Ser. No. 232,459, Mar. 7, 1972, Pat. No. 4,370,720, Ser. No. 230,872, Mar. 1, 1972, Pat. No. 4,531,182, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 134,958, Apr. 19, 1971, and Ser. No. 101,881, Dec. 28, 1970. This application Sep. 27, 1982, Ser. No. 425,135
Claims priority, application Japan, Dec. 28, 1971, 47-3974
Int. Cl.[4] G06F *15/31;* **G06K** *15/20*
U.S. Cl. 364—724 **51 Claims**



18. A display system comprising:

memory means for storing a plurality of signal samples to be displayed;

synchronization means for generating a synchronization signal related to start of a display operation;

address means for generating a sequence of addresses in response to the synchronization signal generated with said synchronization means;

means for sequentially accessing a plurality of signal samples

stored in said memory means under control of the sequence of addresses generated with said address means;

a filter processor for generating filtered signal samples in response to the stored signal samples accessed from said memory means under control of said sequentially accessing means, said filter processor including

a. receiving means for generating input signal samples in response to the stored signal samples accessed from said memory means under control of said sequentially accessing means,

b. reference means for generating reference signal samples,

c. multiplying means for generating product signal samples by multiplying input signal samples generated with said receiving means by reference signal samples generated with said reference means, and

d. summing means for generating filtered signal samples by summing product signal samples generated with said multiplying means; and

a display for displaying filtered information to an operator in response to the filtered signal samples generated with said summing means.

30. A display system comprising:

input means for generating input signal samples;

synchronization means for generating a synchronization signal for synchronizing a CRT display;

a stored program digital computer for iteratively processinng display information in response to the synchronization signal generated with said synchronization means under control of a stored program, said computer including

1. a main memory for storing the program,

2. processing means for iteratively processing the display information in response to the synchronization signal under control of the program stored in said main memory, and

3. output means for iteratively generating output display information in response to the iterative processing with said processing means;

a filter processor for generating filtered signal samples in response to the input signal samples from said input means in response to the display information output from said output means, said filter processor including;

a. receiving means for receiving the input signal samples from said input means,

b. reference means for generating reference signal samples,

c. multiplying means for generating product signal samples by multiplying input signal samples received with said receiving means by reference signal samples generated with said reference means, and

d. summing means for generating the filtered signal samples by summing product signal samples generated with said multiplying means; and

a CRT display for displaying a filtered image in response to the filtered signal samples generated with said summing means under control of the synchronization signal from said synchronization means.

4,551,817

DEVICE FOR DETECTING CENTER POSITION OF TWO-DIMENSIONALLY DISTRIBUTED DATA

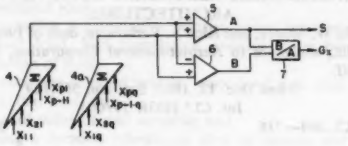
Masatoshi Ishikawa, Ibaraki, Japan, assignor to Director General of Agency of Industrial Science and Technology, Japan

Filed Oct. 24, 1983, Ser. No. 544,740

Int. Cl.[4] G06G 7/12

U.S. Cl. 364—811 **8 Claims**

1. A device for detecting the center position (G_x, G_y) of two-dimensionally distributed data R_{nm}, where n and m are integers of 1 to p and 1 to q, respectively, said data being the outputs from a p×q matrix of sensors with q-number of first to q-th columns arranged in the direction of the X-axis and p-number of first to p-th rows in the direction of the Y-axis, wherein G_x and G_y are expressed as:



$$G_x = \frac{\sum_{m=1}^{q} \sum_{n=1}^{p} (q - 2m + 1) R_{nm}}{\left(\sum_{m=1}^{q} \sum_{n=1}^{p} R_{nm} \right) (q + 1)}$$

$$G_y = \frac{\sum_{m=1}^{q} \sum_{n=1}^{p} (p - 2n + 1) R_{nm}}{\left(\sum_{m=1}^{q} \sum_{n=1}^{p} R_{nm} \right) (p + 1)}$$

said device comprising:

p×q number of first adders respectively coupled with the sensors for receiving the outputs R_{nm} from their corresponding sensors as part of their respective inputs and arranged such that each first adder receives as the remainder of its inputs the outputs of the first adders whose corresponding sensors are positioned in the same row of its corresponding sensor and adjacent thereto, with the outputs X_{nm} generated from the first adders being each a half of their respective total inputs;

p×q number of second adders respectively coupled with sensors for receiving the output R_{nm} from their corresponding sensors as part of their respective inputs and arranged such that each second adder receives as the remainder of its inputs the outputs of the second adders whose corresponding sensors are positioned in the same column of its corresponding sensor and adjacent thereto, with the outputs Y_{nm} generated from the second adders being each a half of their respective total inputs;

first calculating means, coupled with p-number of the first adders whose corresponding sensors are located at the first column, for receiving their outputs X_{n1} and for generating an output which is the sum of its input

$$\sum_{n=1}^{p} X_{n1};$$

second calculating means, coupled with p-number of the first adders whose corresponding sensors are located at the q-th column, for receiving their outputs X_{nq} and for generating an output which is the sum of its inputs

$$\sum_{n=1}^{p} X_{nq};$$

third calculating means, coupled with q-number of the second adders whose corresponding sensors are located at the first row, for receiving their outputs Y_{1m} and for generating an output which is the sum of its inputs

$$\sum_{m=1}^{q} Y_{1m};$$

fourth calculating means, coupled with q-number of the

second adders whose corresponding sensors are located at the p-th row, for receiving their outputs Y_{pm} and for generating an output which is the sum of its inputs

$$\sum_{m=1}^{q} Y_{pm};$$

first means coupled to the first and second calculating means for generating an output of a first value:

$$\frac{\sum_{n=1}^{p} X_{nq} - \sum_{n=1}^{p} X_{n1}}{\sum_{n=1}^{p} X_{n1} + \sum_{n=1}^{p} X_{nq}}; \text{ and}$$

second means coupled to the second and third calculating means for generating an output of a second value:

$$\frac{\sum_{m=1}^{q} Y_{pm} - \sum_{m=1}^{q} Y_{1m}}{\sum_{m=1}^{q} Y_{1m} + \sum_{m=1}^{q} Y_{pm}}$$

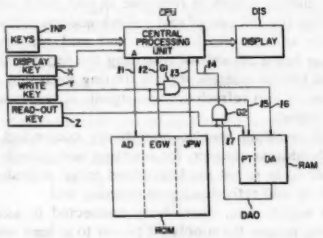
wherein said first and second values are equal to G_x and G_y, respectively.

4,551,818

ELECTRONIC APPARATUS FOR TRANSLATING ONE LANGUAGE INTO ANOTHER

Ichiro Sado; Juji Kishimoto, both of Tokyo; Masayuki Sasaki, Yokohama, and Mitsuo Cho, Ina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 144,216, Apr. 28, 1980, abandoned. This application Feb. 1, 1984, Ser. No. 575,722
Claims priority, application Japan, May 8, 1979, 54-55266
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—900 **10 Claims**



1. An electronic apparatus for translating one language into another in which selected words can be stored for review, said apparatus comprising:

first memory means for storing words of a first language and words of a second language as a plurality of pairs;

second memory means for storing selected ones of the words of said first language stored in said first memory means;

first read out means including means for producing a first read out signal for causing reading out of a selected word of said first language stored in said first memory means;

means connecting said first memory means and said second memory means;

writing means including input means, connected to said connecting means, for producing a writing instruction, said connecting means being responsive to said writing instruction for enabling writing of said selected word read out from said first memory means into said second memory means;

second read out means, connected to said second memory means, including means for producing a second read out signal for reading out a selected one of the words of said first language stored in said second memory means

translation means including means for producing a translation signal for causing reading out from said first memory means a word of said second language corresponding to a word of said first language;

visualizing means for visualizing said words of said first language caused to be read out by said first read out means, words of said first language read out by said second read out means, and words of said second language caused to be read out by said translation means, respectively; and

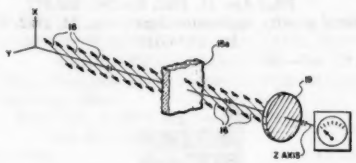
control means connected to said first read out means, said second read out means, said translation means, said visualizing means, and said first memory and being responsive to generation of said first read out signal by said first read out means for reading out said selected word of said first language stored in said first memory means, and being responsive to generation of said translation signal by said translation means to find and read out from said first memory means the words of said second language corresponding to said selected word of said first language read out from said second memory means by said second read out means and visualized by said visualizing means.

4,551,819

OPTICAL RECORDING METHOD AND APPARATUS UTILIZING POLYMERIC BIREFRINGENT MATERIALS

Josef Michl, and Claudio G. Puebla-Ponce, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Apr. 14, 1982, Ser. No. 368,072
Int. Cl.[4] G11C *13/04*
U.S. Cl. 365—120 **13 Claims**



1. A method for semi-permanently recording information comprising the steps of:

obtaining a birefringent polymeric material;

selecting locations on the birefringent material where it is desired to record information; and

irradiating the selected locations with electromagnetic radiation at a wavelength that is absorbed by the birefringent polymeric material in order to modify the birefringence of the material at said locations such that information is semi-permanently recorded onto the birefringent polymeric material.

4,551,820

DYNAMIC RAM INTEGRATED CIRCUIT DEVICE

Hiromi Matsuura, Kodaira, Japan, assignor to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

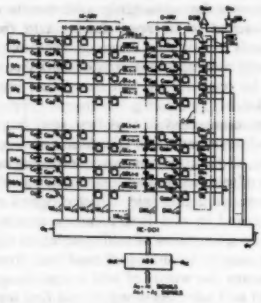
Filed Dec. 23, 1982, Ser. No. 452,446
Claims priority, application Japan, Dec. 25, 1981, 56-209397
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—189 **24 Claims**

1. A dynamic RAM integrated circuit device having a folded bit line arrangement comprising:

a memory array having a predetermined plurality of data line pairs formed on a semiconductor substrate, a plurality of memory cells each connected with a corresponding one

of said plurality of data line pairs and a plurality of word lines each connected with corresponding ones of said plurality of memory cells; and

an additional data line formed on said semiconductor substrate to extend adjacent to and in parallel with a data line pair in said predetermined plurality of data line pairs



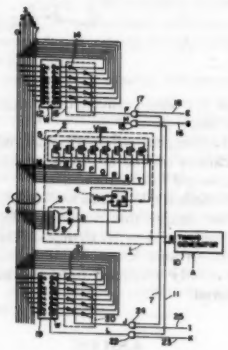
which is disposed at an end of said memory array, said additional data line being permanently decoupled from reading and writing circuits which are coupled to said memory array, thereby to decrease the difference between the stray capacitances connected to the data lines constituting said data line pair disposed at an end of said memory array, respectively.

4,551,821

DATA BUS PRECHARGING CIRCUITS

Hiroshi Yokouchi, and Ryuichi Iketani, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,572
Claims priority, application Japan, Apr. 23, 1982, 57-67452
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—203 **2 Claims**



1. A data bus precharging circuit comprising:

a charging circuit for charging a common data bus in response to a precharge control signal, said common data bus having a plurality of bit lines;

a precharge sensing circuit for generating a reset signal when all of said plurality of bit lines of said data bus are charged, said sensing circuit sensing a charged bit line by sensing that a logic level of said bit line is a logic "1" level; and

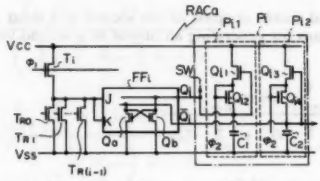
a control signal generating circuit for enabling said charging circuit to charge said data bus when a precharge clock signal is inputted to said control signal generating circuit, and for disabling said charging circuit from charging said data bus when said reset signal is inputted to said control signal generating circuit from said precharge sensing circuit.

4,551,822

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, Yokohama, and Katsuhiko Kabashima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 7, 1982, Ser. No. 447,677
Claims priority, application Japan, Dec. 7, 1981, 56-195561
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—222 **8 Claims**



1. A dynamic semiconductor memory device capable of performing a cyclic refresh operation in response to an external control signal indicative of a state of the refresh operation, comprising:

memory cells, each having a capacitor for storing data;

a refresh-control clock generator for generating a clock signal in response to the external control signal;

a refresh-address counter, operatively connected to said refresh-control clock generator, for sequentially generating refresh-address signals in response to said clock signal, said memory cells being refreshed when addressed by said refresh-address signals, respectively, said refresh-address counter being capable of sequentially changing said refresh-address signals in response to said clock signal and retaining the last one of said refresh-address signals in the absence of said clock signal, and said refresh-address counter being capable of resuming the sequential change of said refresh-address signals starting with said retained last one of said refresh-address signals in response to said clock signal;

an initial resetting means, operatively connected to said refresh-address counter, for resetting said refresh-address counter so as to set predetermined initial refresh-address signals in said refresh-address counter; and

a power supply line, operatively connected to said initial resetting means, for supplying power to at least said initial resetting means, said initial resetting means resetting said refresh-address counter when power is turned on.

4,551,823

METHOD AND APPARATUS FOR ACOUSTIC CEMENT BOND LOGGING

Jerry H. Carmichael, and Charles H. Wellington, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 19, 1981, Ser. No. 322,783
Int. Cl.⁴ G01V *1/40*
U.S. Cl. 367—35 **9 Claims**

1. A method of detecting the relative degrees of bonding of cement to casing in a borehole, comprising the steps of:

traversing said borehole with an instrument, said instrument adapted to periodically transmit acoustic energies through said casing and to receive said acoustic energies at a fixed distance within said instrument from the location of said transmission of said acoustic energies;

transforming said received acoustic energies into a plurality

of electrical signals, each electrical signal comprising both a pulse functionally related to the time of said transmission of said acoustic energies and a plurality of electrical alternations about a reference axis representative of said acoustic energies received by said instrument subsequent in time from said transmission;

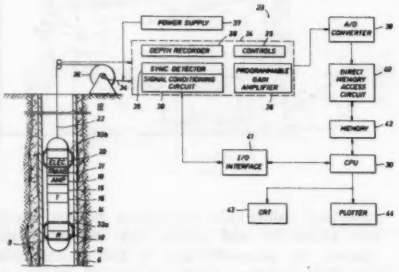
selecting survey signals from said plurality of electrical signals;

digitizing at least a portion of each of said selected survey signals;

selecting at least one of said digitized survey signals to be used as a calibration signal;

selecting at least one half-cycle of one polarity of said calibration signal;

determining time references for said at least one half-cycle, said time references being a function of coincidence of said at least one half-cycle and said reference axis;



defining a portion of each of said survey signals in reference to said time references of said half-cycle of said calibration signal;

determining the area within said half-cycle in relation to said reference axis of said calibration signal;

summing the individual amplitudes within said defined portion of said survey signals, said amplitudes having the same polarity as said half-cycle of said calibration signal, said polarity determined relative to the references axis of said survey signals;

determining from said summation of individual amplitudes the area defined by said individual amplitudes in said survey signals; and

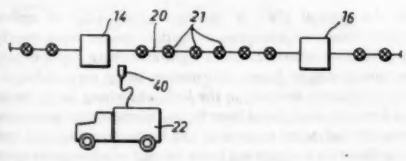
determining from said area of said half-cycle of said calibration signal and said area within said defined area within said portions of each of said survey signals the relative degrees of bonding of cement to casing.

4,551,824

TELEMETRY SYSTEM ADAPTER

William Fehrenkamp; Arnold R. Pater, and Arthur D. Brummel, all of Houston, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Filed Oct. 14, 1982, Ser. No. 434,300
Int. Cl.[4] G01V *1/16, 1/22*
U.S. Cl. 367—76 **1 Claim**



1. In a seismic data gathering telemetry system comprised of a plurality of identical data acquisition array terminals that are serially connected together by cables that transmit seismic data from geophones to the array terminals and then to a recording and control station, and transmit control signals from the recording and control station to said array terminals, and wherein a cable is connected intermediate its ends to one or more geophones and is connected at its respective ends to a pair of array terminals, and wherein a recording and control station conventionally is connected to one end of a cable at an end of the system, said array terminals each having at least a first type of connector adapted to mate only with a different second type of connector and each cable having at each end thereof one of said second type of connectors for mating with said first type connector on an array terminal,

the improvement of a break-in adapter that permits the recording and control station to be removably connected anywhere in the seismic data gathering system between an array terminal and an end of a cable, said adapter comprising,

a second type connector for connection only to a first type connector on an array terminal,

a first type connector for connection only to a second type connector on the end of a cable,

a third connector adapted to be connected only to a recording and control station when the adaptor's first and second type connectors are connected, respectively, to a cable and to an array terminal,

a plurality of analog transmission lines connected between said first and second type connectors of the adapter for transmitting analog signals between the cable and the array terminal to which the adapter is connected,

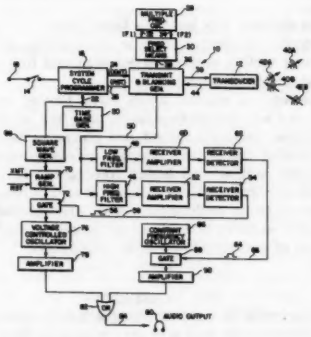
a plurality of digital transmission lines connected between the third connector and each of said first and second type connectors of the adapter for transmitting digital signals between said recording and control station and said array terminal and said cable when the third connector of the adapter is connected to the recording and control station.

4,551,825

SONIC RANGING/DETECTION SYSTEM EMPLOYING VARIED BEAMWIDTH

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 1, 1982, Ser. No. 438,052
Int. Cl.[4] G01S *15/14, 7/52*
U.S. Cl. 367—101 **3 Claims**



1. Object detection apparatus comprising means for transmitting a urst of sonic energy at more than one frequency toward a remote object and detecting a reflection of said energy from said object, said tramsmitting means including an electrostatic transducer having a frequency dependent transmission pattern, and means for alternately changing the sonic energy transmission frequency between relatively high and low frequencies wherein a portion of said transmission pattern

includes a central beam portion defined by a beam angle and said beam portion is alternated between relatively narrow and wide beam angles in response to said alternating sonic energy transmission frequencies;

means responsive to the transmission and reception of said narrow central beam angle burst of sonic energy in a particular direction and at a first frequency toward a remote object for generating a signal respresentative of object distance;

means responsive to said object distance signal for generating an audible signal whose pitch is varied in accordance with the distance to said remote object;

means responsive to the transmission and reception of said wide central beam angle burst of sonic energy at a second frequency in said particular direction for generating a signal respresentative of the presence of an object located in a direction at an angle to said particluar direction; and

means responsive to said object presence signal for generating an audible signal, of constant pitch, indicating the presence of an object in said angled direction.

4,551,826

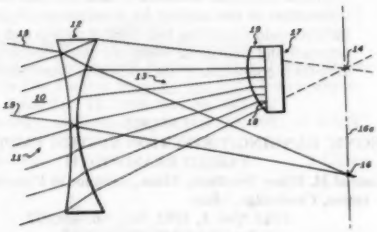
MULTIPLE BEAM LENS TRANSDUCER WITH COLLIMATOR FOR SONAR SYSTEMS

Jacob A. Kritz, Westbury, N.Y., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 453,303, Dec. 27, 1982, abandoned. This application Mar. 8, 1985, Ser. No. 708,388

Int. Cl.[4] H04B *13/00*

U.S. Cl. 367—150 **19 Claims**



1. A multiple beam lens transducer for sonar systems comprising:

a first acoustic lens having a focal plane,

a plurality of electro-acoustic transducers, each having a planar surface positioned between said first acoustic lens and said focal plane; and

a plurality of second lenses each having an outwardly curved forward surface facing said first acoustic lens and a planar surface adjacent said planar surface of a corresponding one of said plurality of electro-acoustic transducers, said second lenses constructed to collimate focussed acoustic waves incident at said curved surfaces so that in-phase collimated waves are coupled from said planar surfaces of said second lenses to said planar surfaces of said electro-acoustic transducers.

4,551,827

FLUORESCENT SOUNDTRACK READOUT SYSTEM

Peter A. Custer, 85 Red Hill Rd., Princeton, N.J. 08540, and George R. Bird, Princeton, N.J., assignors to Peter A. Custer, New York, N.Y.

Continuation-in-part of Ser. No. 088471, Oct. 26, 1979, abandoned. This application Oct. 10, 1980, Ser. No. 196,032

Int. Cl.[4] G11B *7/02, 7/04*

U.S. Cl. 369—101 **12 Claims**

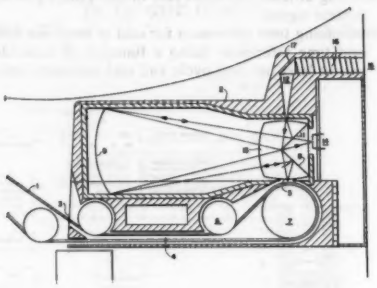
1. A fluorescent soundtrack readout system, comprising:

a. a source of ultraviolet light,

b. a means for directing the ultraviolet light onto the surface of a digitally coded fluorescent soundtrack film to cause the fluorescent soundtrack data matrix to emit visible light, and

c. a means for transmitting the emitted visible light imagewise to a photodiode array to detect the visible light,

wherein the means for directing the ultraviolet light and the means for transmitting the visible light comprise at least one mirror and at least one common lens, wherein the means for directing the ultraviolet light and for transmitting the emitted visible light comprise an ultraviolet light



reflecting, visible light transmitting dichroic mirror and two ultraviolet and visible light reflecting mirrors, wherein the ultraviolet light is first directed onto the dichroic mirror from which it is then directed onto a first totally reflecting concave mirror and then to a second totally reflecting mirror from which it is directed onto the fluorescent soundtrack, and wherein the emitted visible light is directed onto the second total reflecting mirror to the first totally reflecting concave mirror and then transmitted through the dichroic mirror to the photodiode array.

4,551,828

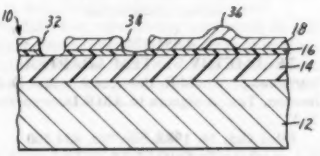
QUADRILAYER OPTICAL DRAW MEDIUM

Chi H. Chung, San Jose, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 18, 1983, Ser. No. 476,503

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—275 **15 Claims**



1. An optical DRAW medium comprising an optically-smooth reflective substrate, an optical spacer layer overlying the reflective substrate, and a light-absorbing layer overlying the optical spacer layer, information being recordable in the form of discrete features in the light-absorbing layer creatable by a focused, modulated laser beam, wherein the improvement comprises: adjacent to each of the light-absorbing and optical spacer layers is a triggering layer formed of an organic material which has a thickness less than that of the optical spacer layer and when heated to a temperature below the melting point of the optical spacer layer rapidly expands to implement or en-

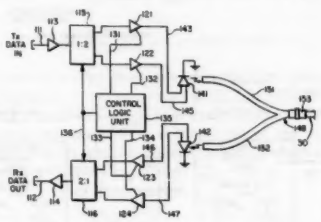
hance the formation of a bubble or pit in the light-absorbing layer.

4,551,829

WAVELENGTH DIVISION MULTIPLEXED FIBER-OPTIC CABLE SYSTEM WITH NON-UNIQUE TERMINAL TYPES

Robert E. Dragoo, Melbourne; James R. Teague, Indialantic; Lee M. Burberry, W. Melbourne; David C. Bailey, Cocoa Beach; Andrew M. Bardos, Indian Harbor Beach, and Barry G. Grossman, Satellite Beach, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 10, 1982, Ser. No. 356,304
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **2 Claims**



1. For use with a single fiber-optic communication system, a transceiver apparatus comprising:

a multiple wavelength source of optical energy capable of controllably emitting a selected one of transmission wavelengths for application to a single optical fiber for transmission thereover;

a multiple wavelength detector capable of controllably detecting a prescribed one of said transmission wavelengths that has been transmitted over said single optical fiber;

control means, coupled to said multiple wavelength source and said multiple wavelength detector, for selectively enabling said multiple wavelength detector to detect a first of said transmission wavelengths that has been transmitted over said single optical fiber, and for selectively enabling said mutliple wavelength source to emit a second of said transmission wavelengths for transmission over said single optical fiber; and

means for coupling said second of said transmission wavelengths emitted by said source into said single optical fiber for transmission thereover and for coupling said first wavelength received from said single optical fiber to said multiple wavelength detector.

4,551,830

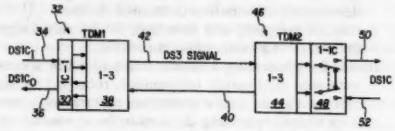
APPARATUS FOR PROVIDING LOOPBACK OF SIGNALS WHERE THE SIGNALS BEING LOOPED BACK HAVE AN OVERHEAD DATA FORMAT WHICH IS INCOMPATIBLE WITH A HIGH SPEED INTERMEDIATE CARRIER OVERHEAD FORMAT

Charles E. Huffman, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 19, 1984, Ser. No. 591,083
Int. Cl.[4] H04J *3/14*
U.S. Cl. 370—15 **4 Claims**

3. The method of inserting switching data control bits in a communication data stream for causing remote destination site switched loopback of given frequency data signals transmitted on a higher frequency data communication line from a local source site where the protocol of the higher frequency data communication line is such that the given frequency data signals cannot be transmitted with their own overhead data bit signals but rather must be divided into lower frequency signal channels and recombined at the destination site to generate said given frequency data signals comprising the steps of:

violating the stuff bit overhead signals assigned at said source site to each of the lower frequency signal channels comprising said given frequency data signals;



detecting the violation of said stuff bit overhead signals at said destination site for each of said channels containing components of said given frequency data signal; and

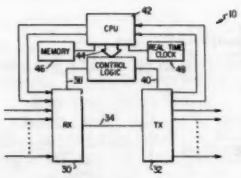
setting switches at said destination site in response to said detection of stuff bit violations whereby the given frequency data signal is looped-back to said source site.

4,551,831

TIME DIVISION MULTIPLEXED SYSTEM FOR NON REAL TIME DIGITAL SWITCHING

Mitchell D. Vaughn, Garland, Tex., assignor to USDATA Corporation, Richardson, Tex.

Filed Jan. 31, 1984, Ser. No. 575,581
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **9 Claims**



1. A communications network, comprising:

a plurality of peripheral communication receiving devices for receiving and processing data;

each of said receiving devices having means for transmitting a status signal indicating if a connection is present;

a plurality of peripheral communication transmitting devices for transmitting data to a select one of said receiving devices

each of said transmitting devices having means for transmitting a status signal indicating the presence of data ready for tansmitting to one of said receiving devices and for receiving a clear to send signal indicating that data can be transferred to said receiving device, said transmitting device transmitting data in response to receiving said clear to send signal;

a signal data highway for carrying said transmit data in a time domain multiplexed format;

multiplexing means having a plurality of input ports interfaced with said transmitting devices and a plurality of output ports interfaced with said receiving devices for receiving the transmit data from all of said transmitting devices and routing it to select ones of said receiving devices over said data highway by time domain multiplexing in accordance with a connection pattern; and

control means for controlling said multiplexing means to interface the transmit data to the select ones of said receiving devices over said data highway in accordance with said connection pattern, said control means having:

means for sampling said transmitting device status signals to determine if data is ready to be transmitted,

means for receiving at said control means said transmit

data in response to receiving said transmitted device status signal indicating data to be transmitted to one of said receiving devices to determine from said transmit data which of said receiving devices is to be interfaced with particular ones of said transmitting devices, said transmit data received by said receiving means having destination information contained therein,

means for sampling said receiving device status signals to determine if a connection is present,

means for generating a connection pattern in accordance with said destination information received by said receiving means, said connection pattern indicating the ones of said receiving devices to be connected to said transmitting devices,

connecting means for connecting said multiplexing means in accordance with said conneciton pattern such that said multiplexing means operates independent of said control means until said control means updates said latch means and

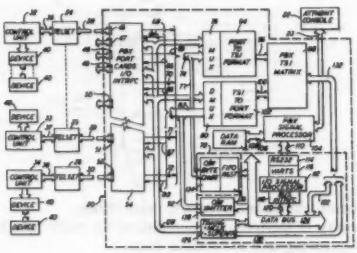
means for transmitting said clear to send signal to said transmitting device to indicate a connection if the select one of receiving devices is not connected.

4,551,832

TELEPHONE BASED CONTROL SYSTEM

Richard T. Carll, Granby; Anthony J. Fastaia, Vernon, both of Conn., and Kurt von Nieda, Los Angeles, Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 2, 1983, Ser. No. 557,693
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **6 Claims**



1. Control system apparatus for regulating a remote controlled device, comprising:

central console means responsive to operator entry signals;

time division multiplexed (TDM) telephone system, including private branch exchange (PBX) signal processing means, PBX memory means, and PBX matrix switch having primary ports for exchanging primary port signals including system data signals and system control signals between said central console, said PBX signal processor, and said station equipment, said PBX signal processing means providing said control signals alternatively as PBX control signals and as secondary port control signals which include said operator entry signals, said station equipment having a station port, a secondary port, and station signal processing means responsive to said primary port signals for transferring received secondary port control signals to said secondary port, received primary port data signals to said station port, and for transferring signals received at said secondary port and said station port to said PBX matrix; and

remote control means, connected for response to the secondary port of associated station equipment and to the remote controlled device, and including,

sensor means for providing sensed value signals of controlled device operating parameters,

control unit memory means, and

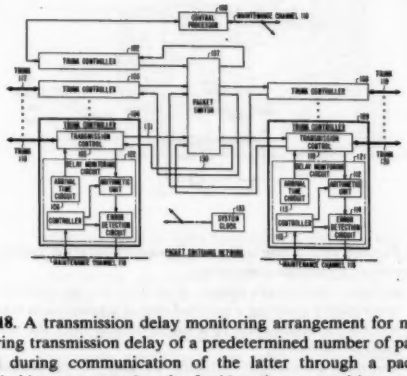
control unit signal processing means for periodically sampling, and storing in said control unit memory means, said secondary port control signals and said sensed signals, to provide regulation of said controlled device in dependence thereon, and to present said stored sensed signals to said secondary port on request of said PBX signal processing means.

4,551,833

DISTRIBUTED MONITORING OF PACKET TRANSMISSION DELAY

Jonathan S. Turner, Evanston, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 10, 1983, Ser. No. 521,884
Int. Cl.[4] H04Q *11/04, 11/00*
U.S. Cl. 370—60 **27 Claims**



18. A transmission delay monitoring arrangement for measuring transmission delay of a predetermined number of packets during communication of the latter through a packet switching system and each of said packets comprising arrival time signals, said arrangement comprises:

means responsive to a receipt of said arrival time signals of each of said predetermined number of packets and the present time for calculating present sum delay signals representing an amount of time consumed in communicating said predetermined number of packets;

means for defining transmission delay thresholds; and

means responsive to said transmission delay thresholds from said defining means, said present sum delay signals from said calculating means, and reference sum signals for indicating transmission delay excursions beyond said thresholds by said present sum delay signals from said reference sum delay signals.

4,551,834

METHOD AND SYSTEM FOR COMMUNICATING OVER AN OPEN COMMUNICATION NETWORK

Jean-Claude Liénard, Brussels, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1983, Ser. No. 545,320
Int. Cl.[4] H04J *6/00*
U.S. Cl. 370—94 **6 Claims**

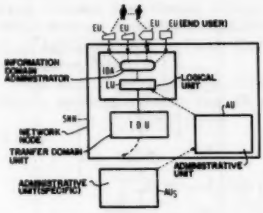
1. A method for operating an open communications network comprising a plurality of network nodes interconnected by transmission resources and a plurality of user boxes connected to the network nodes by further transmission resources, whereby the network nodes includes sending and receiving means, comprising the steps of:

dividing data to be transmitted from a user box into communication data blocks;

providing each communication data block with a communication header comprising at least one code word cyclically numbered for successive communication data blocks;

receiving said communication data blocks in a receiving means of one of said nodes;

monitoring the code word numbers of received communication data blocks and arranging the received data blocks in correct sequence, determining the loss at said receiving means of a communication data block;



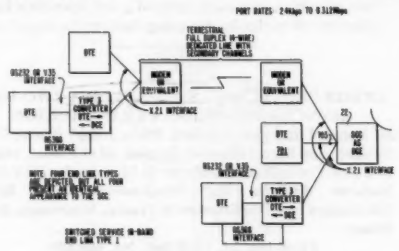
restoring the loss of a communication data block by requesting retransmission of said communication data block from said sending means, and leaving the code word number of the missing communication data block out of the cyclic code word numbers and the monitoring procedure after said restoring procedure is effected.

4,551,835

X.21 SWITCHING SYSTEM

Joseph M. Bensadon, Germantown, and Norman F. Brickman, Potomac, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,312
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—110.1 **8 Claims**



1. In a communications controller having a plurality of X.21 data ports each connected to "t" and "c" input lines from a respective DTE and each connected to "r" and "i" output lines to said respective DTE, said data ports receiving periodic select signals from a digital switch in said controller to transfer message units to and from said data ports at respective port data rates, apparatus for transferring X.21 call establishment signals between said data ports and a control processor, comprising:

a receive buffer having a data input connected to a transmit bus connected in common through said data ports to said "t" and "c" lines, having an address input and a data output, said receive buffer being divided into a scan portion for buffering a port state control message unit from each of said ports and a digit portion for buffering a plurality of port signaling information message units from a selected one of said ports at said respective port data rate;

a transmit buffer having a data input, having an address input and having a data output connected to a receive bus connected in common through said data ports to said "r" and "i" lines, said transmit buffer being divided into a scan portion for buffering a port state control message unit to each of said ports and a digit portion for buffering a plurality of port signaling information message units to a selected one of said ports at said respective port data rate;

a cotrol module having an input connected to said digital switch for receiving said port select signals, having a control input and having a first address output to said address input of said receive buffer and a second address output to said address input of said transmit buffer, for controlling the writing and reading of said port state control message units and said port signaling information message units in said transmit buffer and in said receive buffer;

a microprocessor connected by means of a processor bus to said data output of said receive buffer, to said data input of said transmit buffer, to said control module and to said control processor, for receiving the currently buffered port state control message unit from said scan portion of said receive buffer for each of said ports and computing the next X.21 control state for each of said ports;

said microporcessor providing control signals to said control module in response to said computed next control state, for controlling the writing of said plurality of port signaling information message units into said digit portion of said receive buffer from a selected one of said ports as call establishment signals;

said microprocessor providing control signals to said control module in response to said computed next control state, for controlling the transfer of said plurality of port signaling information message units from said digit portion of said receive buffer over said processor bus to said control processor as call establishment signals;

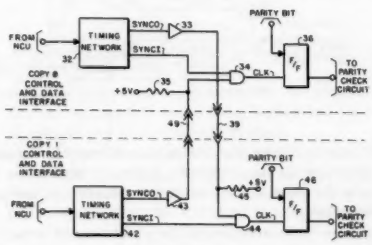
whereby call establishment can be achieved for X.21 data ports at said respective port data rates.

4,551,836

CROSS-COPY ARRANGEMENT FOR SYNCHRONIZING ERROR DETECTION CLOCK SIGNALS IN A DUPLEX DIGITAL SYSTEM

Kamal I. Parikh, Phoenix, Ariz., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,567
Int. Cl.[4] G06F *9/00*
U.S. Cl. 371—1 **3 Claims**



1. A cross-copy arrangement producing first and second synchronized output clock signals in a digital system having first and second peripheral processors, said system including a network clock unit transmitting a master-clock signal, said cross-copy arrangement comprising:

first timing generating means associated with said first peripheral processor, said first timing generating means receiving said master-clock signal and developing a first local timing signal and a first remote timing signal;

first gating means associated with said first timing generating means receiving said first local timing signal;

second timing generating means associated with said second peripheral processor, said second timing generating means receiving said master-clock signal and developing a second local timing signal and a second remote timing signal,

and said first gating means further receiving said second timing generating means second remote timing signal and responsive to the concurrent presence of both said first local timing signal and said second remote timing signal said first gating means develops said first output clock signal; and

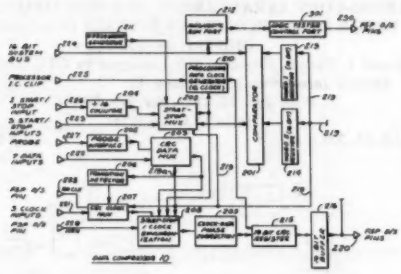
second gating means associated with said second timing generating means receiving said second local timing signal, and said second gating means further receiving said first timing generating means first remote timing signal and responsive to the concurrent presence of both said second local timing signal and said first remote timing signal said second gating means develops said second output clock signal.

4,551,837

HIGH SPEED OPERATIONAL RECURRING SIGNATURE EVALUATOR FOR DIGITAL EQUIPMENT TESTER

Gerald W. Goegelein, Phoenix; Paul H. Longmore, Chandler, and Stan E. Fisher, Phoenix, all of Ariz., assignors to International Telephone & Telegraph Corp., New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,820
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—25 **22 Claims**



1. A test apparatus for enabling a relatively low speed test device to test the operation of a relatively high speed digital circuit at the full operating clock rate thereof, said test apparatus comprising:

(a) signature generating means for generating an actual digital signature from data received from a predetermined point within the digital circuit,

(b) clock control means connected to the digital circuit for clocking the signature generating means at rate consistent with said full operating clock rate,

(c) memory means for storing expected digital signature for a plurality of points within the digital circuit,

(d) control means for receiving digital data indicative of the identity of said predetermined point from the test device, for evaluating the actual digital signature for that point in relation to the expected digital signature for that point, and for communicating the result of that evaluation to the test device,

(e) means for connecting the signature generating means and clock control means to the digital circuit, and

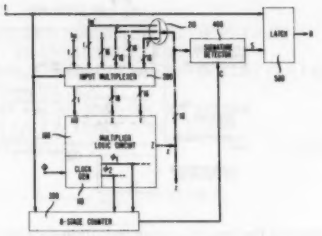
(f) means for connecting the control means to the test device.

4,551,838

SELF-TESTING DIGITAL CIRCUITS

Joel W. Gannett, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 20, 1983, Ser. No. 506,070
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—25 **9 Claims**



1. A logic circuit comprising:

(a) a digital circuit having a first plurality of input terminals for receiving input digital signals to the digital circuit during each cycle of circuit operation and a seond plurality of output terminals for delivering output digital signals from the digital circuit during each such cycle;

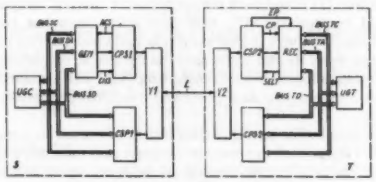
(b) input multiplexer means connected for receiving both normal input digital signals and test signals derived from the output signals by means of a signal processor which receives the output signals and for delivering to the input terminals of the digital circuit the normal input signals during each cycle of normal circuit operation and for delivering to the input terminals of the digital circuit the test signals during each cycle of a test operation havng a plurality of cycles for detecting faults in the digital circuit.

4,551,839

ERROR-PROTECTING SYSTEM FOR A TWO-WAY ASYNCHRONOUS DATA TRANSMISSION

José Botrel, Liffré ; Sami Harari, Paris; Joseph Briere, Cesson-Sevigné , and Bernard Louvel, Rennes, all of France, assignors to L'Etat Francais represente par le Ministre des PTT (Centre National d'Etudes des Telecommunications), Issy-les-Moulineaux and Telediffusion de France, Montrouge, both of, France

Filed Jan. 24, 1983, Ser. No. 460,534
Claims priority, application France, Feb. 4, 1982, 82 02120
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—35 **11 Claims**



1. A method for asynchroneously transmitting data and in particular for transmitting data in an interactive videotex system, said method comprising the steps of:

(a) forming each character with a parity bit for signalling with a continuous ARO-type retransmissin method;

(b) forming the data to be transmitted into blocks of code words, each of said code words being comprised of a block of seventeen bytes "1"–"5" constituting the characters to be transmitted; and

(c) encoding said data by a use of seven bits b1–b7, the eighth bit b8 of each byte being a parity bit, the sixteenth byte being a check byte of the code word, and the seventeenth byte being an enabling byte of the code word.

4,551,840

DIGITAL DATA DUPLICATION APPARATUS

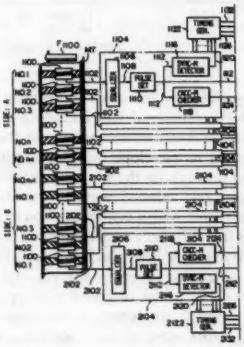
Yasuhiko Fujii, Yamato; Isao Owaki, Tokyo; Susumu Saito; Takaro Mori, both of Sagamihara, and Shinji Nakamura, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

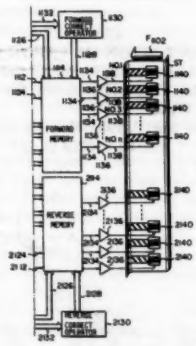
Filed Dec. 27, 1982, Ser. No. 452,971

Claims priority, application Japan, Dec. 29, 1981, 56-215893

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—38 **5 Claims**





1. A digital data duplication apparatus for reproducing digital primary data stored in a master recording medium and recording the reproduced primary data in a slave recording medium, comprising:

a data recording device for recording the digital primary data on the master recording medium, said recording device comprising formatting means for formatting the primary data when the primary data is to be recorded on the master recording medium, adding means for adding secondary check data including at least a master parity code to the primary data employing each fragment of the primary data as a unit, and first recording means for recording said primary and secondary check data on the master recording medium in opposite directions comprising a forward direction and a reverse direction; and

a data reproducing device for reproducing at the same time both the primary data and secondary check data recorded on the master recording medium in both the forward and reverse directions, said reproducing device comprising forward data take-in means for taking in the primary and secondary check data recorded in the forward direction to detect an error in said take-in primary data using a generator polynomial, reverse data take-in means for taking in the primary and secondary check data recorded in the reverse direction to detect an error in said take-in primary data using a reciprocal polynomial, forward master reproduction processing means connected to the forward data take-in means for correcting said detected error, reverse master reproduction processing means connected to the reverse data take-in means for correcting said detected error, and second recording means connected to both the forward and reverse master reproduction processing means for recording at the same time on the slave recording medium the corrected primary data recorded in both the forward and reverse directions.

4,551,841

ONE-CHIP SEMICONDUCTOR DEVICE INCORPORATING A POWER-SUPPLY-POTENTIAL DETECTING CIRCUIT WITH RESET FUNCTION

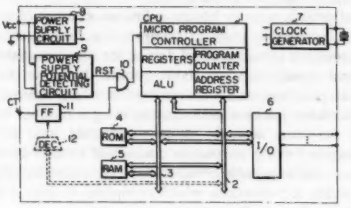
Kouichi Fujita, Yokohama, and Moritoshi Shirato, Kawagoe, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 9, 1983, Ser. No. 502,591

Claims priority, application Japan, Jun. 9, 1982, 57-098649; Jun. 30, 1982, 57-113308

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—66 **24 Claims**



1. A semiconductor device having a check mode comprising:

first and second power supply terminals, the potential of said first power supply terminal being higher than the potential of said second power supply terminal;

an internal circuit, operatively connected to said first and second power supply terminals, for receiving the potentials of said first and second power supply terminals;

a power-supply-potential detecting circuit, operatively connected to said first and second power supply terminals and to said internal circuit, for detecting the potential at said first power supply terminal and generating a reset signal for resetting said internal circuit when the potential at said first power supply terminal is lower than a predetermined value;

a reset signal inhibiting circuit having a first input operatively connected to said power-supply-potential detecting circuit for receiving said rest signal, having a second input for receiving a control signal, and having an output operatively connected to said internal circuit, said reset signal inhibiting circuit inhibiting the transmission of said reset signal when receiving said control signal; and

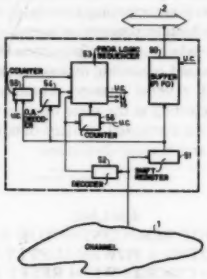
generating means, operatively connected to said reset signal inhibiting circuit, for detecting the check mode and for generating said control signal in response to detecting the check mode.

4,551,842

ERROR-PROTECTED DATA TRANSMISSION DEVICE AND COMMUNICATION NETWORK

Gérard Segarra, Jossigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,369
Claims priority, application France, Jan. 11, 1982, 82 00285
Int. Cl.[4] H04L *1/00*; H04B *3/04*
U.S. Cl. 371—69 10 Claims



5. A data communication network comprising at least one transmitting station and one receiving station, said transmitting station comprising:

a control device for controlling the transmission of messages on the network, said control device being provided for generating an adjustment signal for each message generated by said transmitting station;

an adjustable counter having a limited number of positions, said adjustable counter comprises a first counter input connected to said control device for receiving said adjustment signal, said adjustable counter being set to one of said positions under control of said adjustment signal, which set position indicates the integer number of copies of the same message to be transmitted, said adjustable counter having an output connected to said control device, said adjustable counter being provided for producing a series of indications which comprises at least a first and a second mutually exclusive indications;

storage means for temporary storage of a message generated by the transmitting station, said storage means being connected to said control device;

an encoder connceted with said storage means for providing an error recognition code to each generated message;

adding means for adding under control of said control device and said adjustable counter said first indication to the first copy and said second indication to the last copy of said integer number of copies of the same message;

said control device being further provided for transmitting consecutively each generated message together with its provided error recognition code as many times as indicated by said set position;

said receiving station comprising:

a decoder connected to said network for decoding received messages on the basis of their added error recognition code and for generating an acceptance signal if a received message has been correctly decoded;

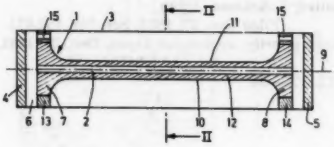
receiving means having a control input connected to said decoder for receiving said acceptance signal and a data input connected to said network for receiving messages transmitted thereon, said receiving means comprising recognition means for recognizing among said received messages said copies of a same message, said receiving means further comprising first fetching means for fetching among said recognized copies under control of said acceptance signal only a single copy for which said acceptance signal has been generated.

4,551,843

GAS WAVE-GUIDE LASER GENERATOR

Michel Ouhayoun, Paris, and Alain Robert, Vitry, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jul. 7, 1983, Ser. No. 511,460
Claims priority, application France, Jul. 9, 1982, 82 12147
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 6 Claims



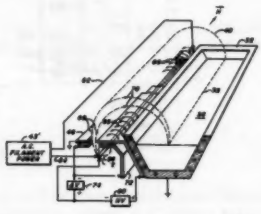
1. A wave guide laser generator comprising a monolithic bar made of dielectric material and including a thinned portion extending over an intermediate portion of the bar; a resonant cavity defined by an envelope means and comprising a capillary extending throughout the bar, said capillary filled with an active laser gas; said thinned portion extending closely adjacent and coextensive with a central portion of said capillary on opposite sides thereof; and a high frequency electrical pumping means for provoking a laser discharge in said active gas and generating a population inversion therein, said pumping means comprising two electrodes disposed contiguous with and extending over virtually the whole of the length of said thinned portion on opposite sides of said capillary, one of said two electrodes being thread-like in form, the other strip-like in form.

4,551,844

DEMODULATION OF VAPOR DENSITY

Paul N. Arendt, Los Alamos, N. Mex., and Vance I. Valencia, San Diego, Calif., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Apr. 5, 1983, Ser. No. 482,184
Int. Cl.[4] H01J *27/00*
U.S. Cl. 373—12 12 Claims



1. An electron beam evaporation system comprising:

a vapor source including an electrically conductive crucible;

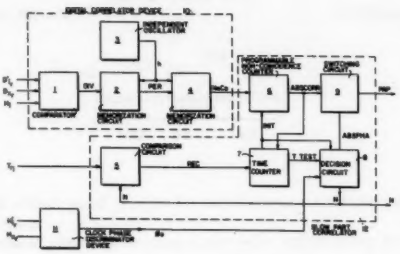
a source of electrons including a filament, means for applying alternating heater current to said filament, means for focusing electrons from said filament to said crucible, means for applying a d.c. voltage to said filament such that a voltage differential is established between said filament and said crucible; and,

means for reducing non-uniformities in vapor density caused by periodic trapping of electrons near said filament due to the alternating magnetic field produced by said alternating heater current.

4,551,845
SYSTEM FOR PHASING DIGITAL TRAINS AND APPLICATION THEREOF TO THE SWITCHING OF SAID TRAINS

Charles H. ab der Halden, Tregastel, and Pierre H. Berenguier, Paris, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed May 4, 1982, Ser. No. 374,699
Claims priority, application France, May 6, 1981, 81 09002
Int. Cl.[4] H04L *7/00, 1/22*
U.S. Cl. 375—40 **2 Claims**



1. A system for detecting and correctng the phase differences between the respective input digital signal trains of a normal and a switchable backup transmission channel, which ostensibly have identical data streams and clocking, wherein said system comprises:

(a) a data-pulse comparing means for determining the coincidence of corresponding data bits between the two input signal trains whereby an output signal (DIV) is generated by said comparing means with the occurrence of at least one noncoincidence between corresponding data pulses within a predetermined time interval;

(b) a master clocking means for enabling said data-pulse comparing means for said predetermined time interval and connected thereto and whose time base is identical with the clocking of said digital signal trains;

(c) a first latching means connected to the output of said data-pulse comparing means for memorizing said output signal (DIV) for a period h, which corresponds to a packet of a predetermined number of whole bits in said data streams, whereby said latching means generates an output signal (PER) after said period h when there exists at least one noncoincidence among previously compared corresponding pulses in a given packet;

(d) a second latching means connected to receive the output of said first latching means for memorizing said output signal (PER) for said period h, whereby said second latching means generates an output signal (NoCo) after said interval h when there exists at least one noncoincidence in a preceding packet;

(e) a local oscillator connected to enable simultaneously the memorizing actions in both said latching means wherein the time base of said oscillator is equal to period h;

(f) a pulse upcounter connected to said control latching means for counting its output pulses (NoCo) up to a maximum selectable number q in an interval between strobing pulses (INIT), whereby said upcounter generates an output signal (ABSCORR), indicative of a phase mismatch between the two compared digital signal trains, whenever said maximum count q is reached;

(g) a timing and gating means connected to said upcounter to provide it with strobing pulses (INIT) after every elapse of a selectable interval t_1 and also connected to said upcounter's output whereupon receiving this output signal (ABSCORR) said timing and gating means is initialized jointly upon the receipt of a phase-search signal (REC) through a separate input, and whereupon said timing and gating means generates a second output signal (TTEST) at a separate output in the absence of a received signal (ABSCORR) from said upcounter during said initialized interval t_1;

(h) a clock-phase discriminator which monitors and compares, through conventional sampling interconnections, the time bases of the two digital signal trains and generates an output signal (ϕo) when there exists a significant phase difference between said time bases;

(i) A decision circuit whose inputs include connections to said timing and gating means and to said clock-phase discriminator, whereby, if the output signal from this latter input (ϕo) is received within an interval t_1 of the receipt of the second output signal from this former input (TTEST), an output signal (ABSPHA) is generated by said decision circuit, and wherein said decision circuit is further connected to and initialized by the strobing-pulse output (INIT) of said timing and gating means, and wherein said decision circuit generates a channel-status signal (N) which is indicative of whether the normal transmission channel has been switched in favor of said backup channel;

(j) an XOR-type comparator whose duly connected inputs include said channel-status signal (N) and a channel-switch command signal (T_{FI}), whereby said XOR-type comparator generates said phase-search signal (REC) for transmission to said timing and gating means;

(k) a switching circuit connected to said pulse upcounter and to said decision circuit, whereby an output signal from at least one such input (ABSCORR and/or ABSPHA) will cause said switching circuit to emit a control signal (PAP);

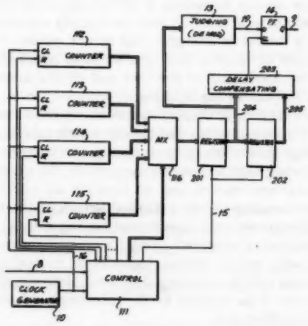
(l) a phase-shifting means connected to receive and respond to said control signal (PAP) from said switching circuit such that the phase of the switchable backup digital train is varied on a demand basis; and

(m) means for conducting and sampling said two digital signal trains with respect to the system for detecting and correcting phase differences therebetween and means for generating said channel-switch command signal (T_{FI}) which serves as an independent demand indicator for said system that the transmission of data is about to be switched from the normal channel to the backup channel, thereby initializing the operation of said system.

4,551,846
FSK DEMODULATION CIRCUIT

Koji Takeda; Masao Akahane; Fumiaki Mukaiyama, and Yasuhiko Kudo, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,059
Claims priority, application Japan, May 8, 1981, 56-69137
Int. Cl.[4] H04L *27/14*
U.S. Cl. 375—82 **11 Claims**



1. A circuit for demodulating an FSK signal that has first

and second frequencies which respectively correspond to the high and the low of a binary signal, the circuit comprising:

clock means having a train of clock pulses as an output;

detector means responsive to an FSK input signal to provide a zero-cross output signal having zero-cross intervals;

N counter means, where N is equal to or greater than 2, each counter means having the clock pulses as an input and responding in succession to count the clock pulses in N zero-cross intervals of the zero-cross signal to provide an output;

means for dividing the output of each counter means in sequence by N to provide an average count value for each zero-cross interval, the possible error in the count value for each interval so produced being decreased by 1/N;

means for comparing each successive average count value with a predetermined threshold count value to provide a comparison signal output; and

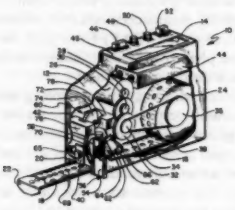
storage means having a demodulated binary signal as an output in which transitions in the output are delayed by the comparison signal.

4,551,847

HAND HELD DIGITAL MEASURING DEVICE

W. Kenneth Caldwell, 11700 W. 24th Pl., Lakewood, Colo. 80215

Filed Apr. 8, 1983, Ser. No. 483,381
Int. Cl.[4] G01B 3/08
U.S. Cl. 377—24 **27 Claims**



1. A hand-held motorized measuring tape comprising:

(a) a housing means;

(b) a measuring tape means including an elongated thin and flexible tape having a predetermined length which is wound on a shaft which is rotatably mounted within said housing, the free end of said tape being arranged to extend outwardly from said housing through a suitable opening;

(c) reversible drive motor means mounted within said housing and connected to said tape rotating shaft by a suitable drive means;

(d) an electrical power source mounted in said housing, said power source including a switch mounted on the outer surface of said housing and electrically connected to said motor means to energize said motor means in either the forward or reverse direction so as to result in the extension or retraction of the free end of the measuring tape with respect to the housing;

(e) a digital output display means mounted on said housing and a sensing means positioned within said housing, said sensing means being arranged in conjunction with said measuring tape to accurately measure the lineal extension of said tape means and to provide an accurate digital output reading of the extended length of the tape on the display means; said tape means having a series of equally spaced holes arranged along its central longitudinal axis and said sensor means includes a rotatably mounted sprocket which is arranged to mesh with the holes in said tape and to be rotated by the movement of said tape;

(f) an encoding disk;

(g) said sprocket means is drivingly connected to said ending disk whereby any rotation of the sprocket will be directly translated to similar rotation in the encoding disk, and switch means mounted in conjunction with said encoding disk to sense rotational movement of said disk and provide an output to the digital display means to accurately indicate the extended length of the tape means; and

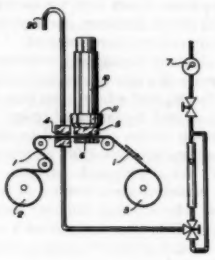
(h) said encoding disk is divided into alternating segments and the switch means includes at least two optical switches which are positioned around the circumference of said disk to provide electrical phase-related inputs to the electronic circuit for said display means which are indicative of the rotational direction of the adjacent disk segment.

4,551,848

LEAD-IN-AIR MONITOR

Robin Greenwood-Smith, Mount Isa, Australia, assignor to Mount Isa Mines Limited, Australia

Filed Nov. 29, 1982, Ser. No. 445,197
Claims priority, application Australia, Dec. 10, 1981, PF1904
Int. Cl.[4] G01N 23/22
U.S. Cl. 378—045 **12 Claims**



1. A health safeguard system for operation in an atmosphere containing hazardous substances such as lead, arsenic or other elements which are x-ray fluorescent wherein said system continously suctions in air samples from said atmosphere and measures the level of these hazardous substances by bombarding them with x-ray excitaiton and measuring their fluorescence emission, which comprises:

means for filtering a quantity of air and for retaining on a filter, media particles filtered therefrom at a first position;

means for transporting the media and retained particles from the first position to a second position proximate to the first position;

means for exposing the particles at the second position to X-rays;

means for detecting radiation in a spectral range including the range of X-ray-induced fluorescence of predefined elements during a predetermimed interval, said detecting means including means for transmitting an output signal indicative of quantity of said radiation; and

microprocessor means for controlling the transporting means and the detecting means so that the peak response to scatter radiation is maintained at a predetermined value.

4,551,849

VEHICLE PANEL SPEAKER FOR AUTOMOTIVE AUDIO SYSTEM UTILIZING PART OF A VEHICLE PANEL AS A SOUND-PRODUCING MEDIUM

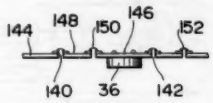
Junichi Kasai; Takayuki Yanagishima, both of Yokosuka; Akio Ajimine, Tokyo; Yoshiaki Murakami, Tokyo; Akimitsu Shino, Tokyo, and Tatsuya Watanabe, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,292

Claims priority, application Japan, May 11, 1982, 57-78634; Jun. 1, 1982, 57-92200; Jul. 12, 1982, 57-119882; Jul. 13, 1982, 57-120484

Int. Cl.⁴ H04R *9/06*

U.S. Cl. 381—86 **22 Claims**



1. A vehicle panel speaker for an automotive audio system comprising:

a vehicle panel constituting a part of a vehicle body and adapted to oscillate at an audio frequency for producing an audio sound, said vehicle panel including a central first section and a second section surrounding said first section;

an intermediate section interpositioned between said first and second section for transmission of the audio frequency vibration therebetween, said intermediate section being relatively flexible in comparison with said first and second sections so as to allow said first section to oscillate at low frequency range of the audio frequency in an amplitude sufficient for reproducing audio sound; and

a driver unit secured at approximately the center of said first section and adapted to drive said vehicle panel at the audio frequency in response to an audio signal fed from the automotive audio system, said driver unit including a housing secured to said vehicle panel and a driver assembly received in said housing and resiliently suspended therein, said driver assembly associated with a voice coil wrapped around a bobbin extending from said vehicle panel for causing vibration of said vehicle panel in accordance with said audio signal.

4,551,850

RESPONSE DETECTOR FOR PATTERN PROCESSING SYSTEM

Larry J. Werth, Eagan, and Larry G. Paulson, Moundsview, both of Minn., assignors to Pattern Processing Technologies, Inc., Minneapolis, Minn.

Filed Feb. 7, 1983, Ser. No. 464,624

Int. Cl.⁴ G06K *9/70*

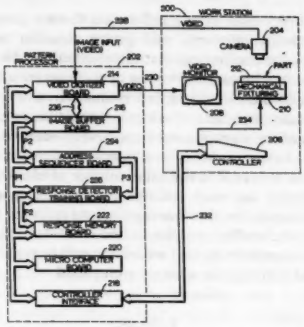
U.S. Cl. 382—18 **11 Claims**

1. A method of providing an output based upon a pattern, the method comprising:

providing an input value representative of the pattern in response to an address;

providing an address stream containing a sequence of addresses in which each address of the sequence is determined by a preceding address and the input value provided in response to the preceding address so that the sequence contains an address loop which characterizes the pattern;

writing a code into selected locations of a response memory which are addressed by the address stream during a training mode;



forming a histogram of codes read out from the response memory which are addressed by the address stream during a time interval; and

providing an output based upon the histogram.

4,551,851

CIRCUIT ARRANGEMENT FOR MACHINE CHARACTER RECOGNITION

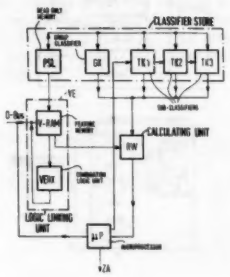
Wilfried Kochert, Constance, Fed. Rep. of Germany, assignor to Computer Gesellschaft Konstanz mbH, Fed. Rep. of Germany

Continuation of Ser. No. 279,360, Jul. 1, 1981, abandoned. This application May 14, 1984, Ser. No. 610,180

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3026055

Int. Cl.⁴ G06K *9/70*

U.S. Cl. 382—38 **6 Claims**



1. An arrangement for machine character recognition comprising:

a classifier device comprising a group classifier and a plurality of sub-classifiers each storing classifier coefficients;

a feature memory for receiving and storing a respective bit pattern corresponding to each respective character to be classified, said feature memory connected to said classifier device;

a read-only memory for storing link addresses of the data contained in the feature memory and the appertaining classifier coefficients contained in said classifier device, said read-only memory connected to said group classifier and to said plurality of sub-classifiers and to said feature memory;

an arithmetic unit for calculating first and second estimated values assigned to the individual character classes within a character set from the bit pattern, stored in said feature

memory for classification, on the basis of the classifier coefficients, said arithmetic unit connected to said feature memory and to said group classifier and said subclassifiers; and

a microprocessor connected to said feature memory and to said arithmetic unit, said group classifier storing such character coefficients that the character to be classified is respectively assigned to one of n character groups on the basis of the calculated first estimated values, said microprocessor operable to select a respective subclassifier for each of the n groups and respectively assigned to different Z/n character classes as a function of the first estimated values, where Z is the total number of classes within the character set, said microprocessor further operable in response to the classifier coefficients received from one of said subclassifiers and the second estimated values calculatable therefrom by said arithmetic unit to supply an output signal defining the character classified.

4,551,852

PROCESS FOR SPREADING THE VOLUME OF TRAFFIC OVER DIFFERENT CONTROL CHANNELS OF A CELLULAR RADIO TRANSMISSION SYSTEM

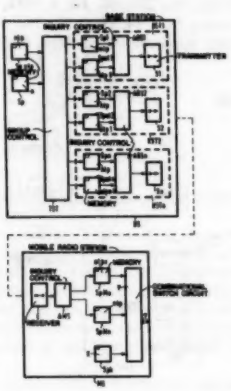
Christoph Grauel, Feucht, Fed. Rep. of Germany; Philippe Duplessis, and Alain Tarabout, both of Velizy, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,385

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246743

Int. Cl.[4] H04B *7/00*

U.S. Cl. 455—33 **13 Claims**



1. A process for spreading the volume of traffic over different control channels of a cellular radio transmission system including a base station having at least two control channels comprising

(a) subdividing at said base station the number of mobile radio stations (MS) in a cellular area of said base station into a variable number of groups (ntp);

(b) transmitting from said base station the variable number of groups (ntp) and a group code (atp) on each control channel;

(c) receiving said transmitted number of groups (ntp) and group code (atp) at each of said mobile stations;

(e) combining at said mobile radio stations (MS) said received number of groups (ntp) and said received group code (atp) with a stored group code number (K); and

(f) assigning at said mobile station one of said control channels to said mobile station when the result of said combining step is a predetermined number.

4,551,853

APPARATUS FOR PROCESSING SPEECH IN RADIOELECTRIC TRANSMITTER/RECEIVER EQUIPMENT SUITABLE FOR TRANSMITTING AND RECEIVING SPEECH

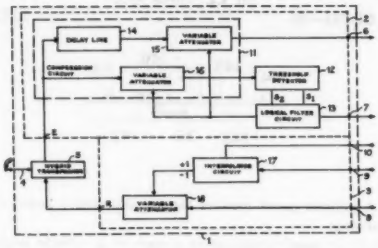
Pierre Deman, Paris, and Jean Potage, Franconville, both of France, assignors to Thomson CSF, Paris, France

Filed Nov. 3, 1983, Ser. No. 548,563

Claims priority, application France, Nov. 10, 1982, 82 18095

Int. Cl.[4] H04B *1/64*

U.S. Cl. 455—72 **13 Claims**



1. Apparatus for processing an input voice signal into a transmission voice signal having a substantially constant level, and for processing a reception voice signal having a substantially constant level into an output voice signal, and for processing digital data representing variations in level of a syllabic term of said voice signals, said transmission and reception voice signals being transmitted to/received from a radio transmitter/receiver main channel, said digital data being transmitted to/received from a radio transmitter/receiver auxiliary channel, comprising:

incremental compreessor means for compressing said input voice signal to provide said transmission voice signal;

threshold detector means, coupled to said incremental compressor means, for detecting variations in level of said syllabic term of said input voice signal;

control means, coupled to said incremental compressor means and controlled by said threshold detector means, for maintaining said transmission voice signal at a substantially constant level, and for providing said digital data to said auxiliary channel;

expander means for receiving said reception voice signal and providing said output voice signal; and

interpolator means, coupled to said expander means, for receiving said digital data from said auxiliary channel and controlling said expander means to cause a level of said output voice signal to be reestablished, and for correcting errors in said received digital data.

4,551,854

ANTI-BLOCKING DEVICE INCLUDING STUCK MICROPHONE RELIEVER FOR AIRCRAFT VOICE COMMUNICATION SYSTEM

John G. Rutty, R.D. 5, Box 292, and Alfred Arndt, R.D. 4, Box 346, both of, Hanover, Pa. 17331

Filed Aug. 22, 1983, Ser. No. 525,461

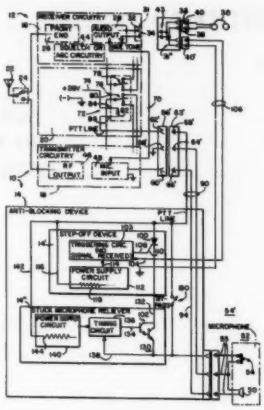
Int. Cl.[4] H04B *1/44*

U.S. Cl. 455—78 **20 Claims**

1. In combination with an aircraft voice communication radio of the type including radio receiver circuitry and radio transmitter circuitry selectively operable on any one of a plurality of radio frequency channels, and including a microphone switch circuit for activating the transmitter circuitry and deactivating the receiver circuitry, the microphone switch circuit being susceptible to undesired activation, an anti-blocking device comprising:

a step-off device including sensing means connected to said

receiver circuitry for sensing when a particular selected radio frequency channel is in use, and a transmitter-disabling means connected to said sensing means and to the transmitter circuitry for preventing activation of said transmitter circuitry by the microphone switch circuit when the particular selected radio frequency channel is in use; and



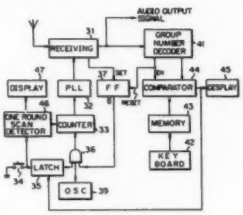
a stuck microphone reliever including a second transmitter-disabling means connected to the microphone switch circuit and to the transmitter circuitry for limiting any transmission to a predetermined duration even though the microphone switch is activated for a longer duration.

4,551,855

RADIO COMMUNICATIONS SYSTEM FOR DETECTING THE COINCIDENCE OF DECODED INFORMATION

Masanori Kurosaki, and Katsuaki Kawamura, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,387
Claims priority, application Japan, Nov. 15, 1982, 57-200138
Int. Cl.[4] H03J *7/18*
U.S. Cl. 455—161 **2 Claims**



1. A radio communications system having a plurality of channels, comprising:

a receiving part for receiving an RF signal transmitted by another station and for reproducing an audio output signal;

a frequency scanning means for sequentially shifting the tuning frequency of said receiving part, said frequency scanning means including an oscillator for generating a clock signal of a predetermined frequency, a counter means for counting said clock signal, a Phase Locked Loop frequency synthesizer means for generating a frequency signal for controlling the tuning frequency of the receiving part in accordance with the content of said counter means, a gate means for controlling the transmission of said clock signal to said counter means, a scan start switch for generating a signal to be applied to the gate means as a gate control signal, and a latch means for latching said signal generated by the scan start switch;

group number detector means for detecting a presence of a carrier signal on each of said channels, and for picking up group number information from said carrier signal, said group number detector including means for producing a pulse signal when the group number information is detected from the carrier signal; and

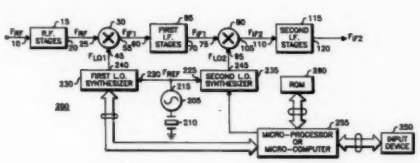
means for stopping operation of said frequency scanning means when said group number picked up by said group number detector means is identical with a preselected group number, wherein said means for stopping the operation of the frequency scanning means comprises a flip flop to be set when the carrier signal is detected in the receiving part and to be reset at the timing of a trailing edge of said pulse signal generated by the group number detector means whose $\overline{Q}$ output signal is applied to said gate means as a gate control signal, and comparator means to be triggered at a timing of a leading edge of said pulse signal generated by the group number detector means to compare said group number information with a preselected group number, and to produce a reset signal of said latching means when the detected group number information is identical with the preselected group number.

4,551,856

SYNTHESIZED MULTIPLE CONVERSION RECEIVER SYSTEM WITH PROVISION FOR AVOIDING RECEIVER SELF-QUIETING SPURIOUS RESPONSE

Alan M. Victor, Cooper City, and Darrell E. Davis, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 16, 1983, Ser. No. 495,308
Int. Cl.[4] H04B *1/16;* **H03J** *7/18*
U.S. Cl. 455—183 **12 Claims**



5. A multiple conversion superheterodyne receiver system, comprising:

a plurality of cascaded frequency mixers arranged to provide multiple frequency conversion of an incoming frequency corresponding to a predetermined channel;

means for selecting said predetermined channel;

a plurality of frequency generators each coupled to one of said mixers for providing an injection frequency to each of said mixers, each injection frequency constituting either high side or low side injection; and

means for altering one of said injection frequencies between high and low side injection in response to the selection of said predetermined channel to avoid receiver self-quieting.

DESIGN PATENTS

GRANTED NOV. 5, 1985

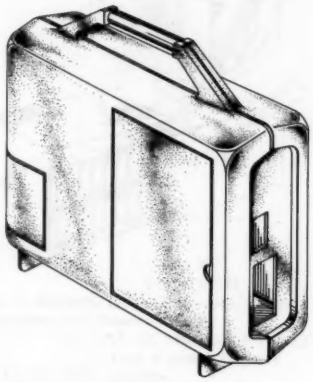
ERRATA

For CLASS	See PATENT NO.
D15–005	281,239

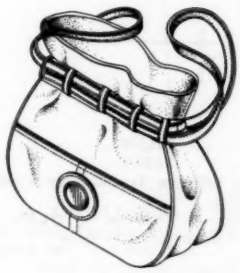
DESIGNS

NOVEMBER 5, 1985

281,200
TAMPERPROOF CARRYING CASE FOR A VIDEO CASSETTE RECORDER
Ted K. Thrush, Phoenix, Ariz., assignor to Portavideo Entertainment Group, Inc., Phoenix, Ariz.
Filed Sep. 12, 1983, Ser. No. 530,897
Term of patent 14 years
U.S. Cl. D3—33



281,201
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Phoenix, Ariz.
Filed Dec. 13, 1982, Ser. No. 449,159
Term of patent 14 years
U.S. Cl. D3—53



281,202
TOOTHBRUSH
Paul H. Thompson, P.O. Box 16, Forest Dale, Vt. 05745
Filed Oct. 19, 1983, Ser. No. 543,344
Term of patent 14 years
U.S. Cl. D4—104

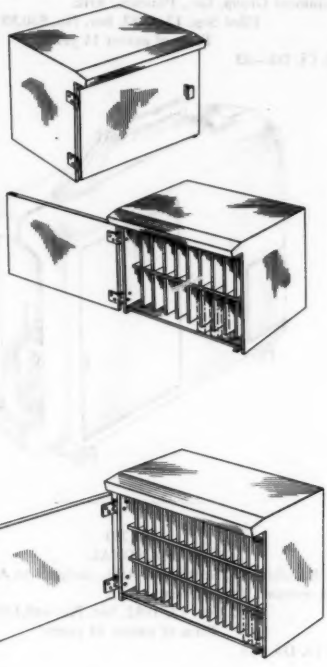
281,203
WALL MOUNTED VALET
Susan T. Nystrom, 297 South St., Medfield, Mass. 02052
Filed Mar. 10, 1983, Ser. No. 474,140
Term of patent 14 years
U.S. Cl. D6—324

281,204
ANTI-THEFT HANGER RING
Gunther Rogahn, Lansdale, Pa., assignor to Independent Products Company, Inc., West Point, Pa.
Filed Mar. 24, 1983, Ser. No. 478,400
Term of patent 14 years
U.S. Cl. D6—328

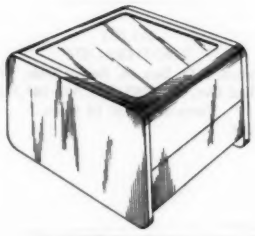
281,205
AUXILIARY SEAT
Richard E. Timmers, 1210 E. County Rd. B, St. Paul, Minn. 55109
Filed Jun. 21, 1983, Ser. No. 506,531
Term of patent 14 years
U.S. Cl. D6—336

281,206
FLEXIBLE SWING
W. Norman Halsall, Bavelselaan 275, 4834TC Breda, Netherlands
Filed Mar. 1, 1983, Ser. No. 470,994
Term of patent 14 years
U.S. Cl. D6—347

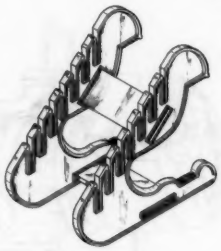
281,207
CABINET FOR VIDEO CASSETTES OR THE LIKE
Joseph M. Armbruster, Lighthouse Point, Fla., assignor to Eagle-Picher Industries, Inc., Ohio
Filed May 2, 1983, Ser. No. 490,370
Term of patent 14 years
U.S. Cl. D6—407



281,208
TABLE
William B. Raftery, Arlington, Tex., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed May 13, 1983, Ser. No. 494,176
Term of patent 14 years
U.S. Cl. D6—449

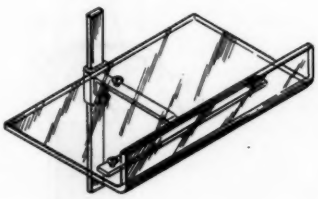


281,209
STAND FOR COMPUTER DISKS
Edward M. Burns, 402 Oakham Pl., Noblesville, Ind. 46060
Filed Jun. 6, 1983, Ser. No. 501,572
Term of patent 14 years
U.S. Cl. D6—468

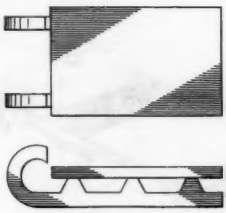


281,210
BACK REST
Frank L. Roberts, Thornhill, Canada, assignor to Bio-Support Industries Ltd, Toronto, Canada
Filed Feb. 10, 1983, Ser. No. 465,570
Term of patent 14 years
U.S. Cl. D6—502

281,211
ARTICLE DISPLAY BRACKET
Wilma R. Beach, Rhinebeck, N.Y., assignor to Daniel E. Gelles Associates, Inc., New York, N.Y.
Filed May 25, 1983, Ser. No. 498,069
Term of patent 14 years
U.S. Cl. D6—572

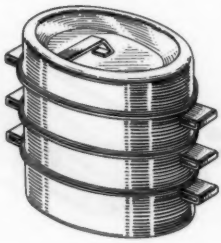


281,212
FOOD CHOPPING BOARD
Joan Appleby, Rte. 1, Clinton, Ark. 72301
Filed Mar. 28, 1983, Ser. No. 463,152
Term of patent 14 years
U.S. Cl. D7—46

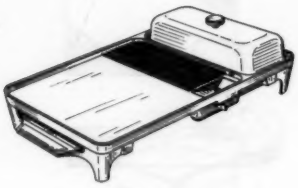


281,213
CABINET FOR STORING, MEASURING AND DISPENSING FOOD STAPLES, SUCH AS COFFEE, SUGAR, FLOUR, OR THE LIKE
Monica F. James, and George E. James, both of 1438 Washington Ave., Apt. #8, Miami, Fla. 33139
Filed Mar. 14, 1983, Ser. No. 475,124
Term of patent 14 years
U.S. Cl. D7—81

281,214
STACKABLE COOKPOT
Pierre A. Schaller, Lyons, France, assignor to Manufacture Metallurgique de Tournus, S.A., Tournus, France
Filed Jun. 2, 1983, Ser. No. 500,388
Term of patent 14 years
U.S. Cl. D7—356

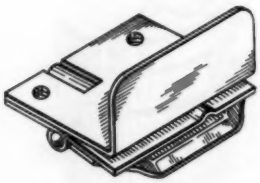


281,215
TABLE TOP COOKING GRILL
Leonard V. Lastuck, Ontario, Canada, assignor to AMC Appliances, division of Algonquin Mercantile Corporation, Weston, Canada
Filed May 12, 1983, Ser. No. 494,107
Term of patent 14 years
U.S. Cl. D7—363

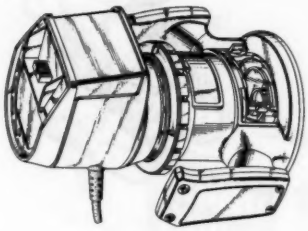


281,216
FIREMAN'S TOOL
Norman J. Cutliff, Jr., 7620 Riverbrook Dr., Dallas, Tex. 75230, and Hugh R. Craft, Box 565, Wills Point, Tex. 75169
Filed Dec. 3, 1982, Ser. No. 446,655
Term of patent 14 years
U.S. Cl. D8—26

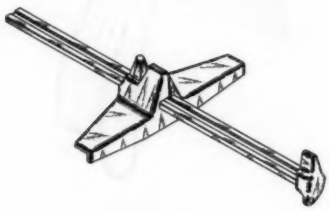
281,217
TAB OPENER FOR EASY-OPEN CANS
Thomas H. Stachler, 5739 Barbanna La., Dayton, Ohio 45415
Filed Nov. 9, 1983, Ser. No. 549,923
Term of patent 14 years
U.S. Cl. D8—33



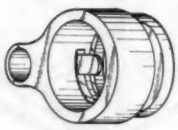
281,218
ROUTER
Michael E. Barrett, Easley; Randy G. Koon, Pickens, both of S.C., and Thomas C. Laughon, Alpharetta, Ga., assignors to The Singer Company, Stamford, Conn.
Filed Apr. 11, 1983, Ser. No. 484,094
Term of patent 14 years
U.S. Cl. D8—67



281,219
STRIP CUTTER
Melvin H. Best, Topanga, Calif., assignor to Glastar Corporation, Northridge, Calif.
Filed Feb. 16, 1982, Ser. No. 349,036
Term of patent 14 years
U.S. Cl. D8—98

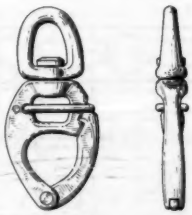


281,220
TRAILER LOCK
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Filed Dec. 2, 1983, Ser. No. 557,205
Term of patent 14 years
U.S. Cl. D8—331



281,221
HOSE BRACKET
Robert G. Edmiston, 912½ N. Benton Way, Los Angeles, Calif. 90026
Filed Feb. 8, 1983, Ser. No. 465,004
Term of patent 14 years
U.S. Cl. D8—356

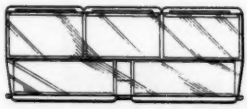
281,222
SNAP HOOK
Christian Faidide, Marinques, France, assignor to S.A.R.L. Wichard, Thiers, France
Filed Jul. 20, 1983, Ser. No. 515,482
Claims priority, application France, Jan. 21, 1983, 830197
Term of patent 14 years
U.S. Cl. D8—367



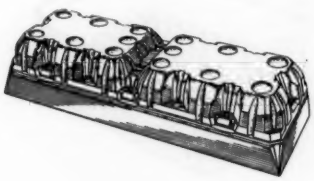
281,223
BOTTLE OR THE LIKE
Timothy Dearing, Ipswich, England, assignor to E. R. Howard Limited, Suffolk, England
Filed Jan. 28, 1983, Ser. No. 461,763
Term of patent 14 years
U.S. Cl. D19—322

281,224
MASK AND SNORKEL PACKAGE
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Jul. 13, 1983, Ser. No. 513,269
Term of patent 14 years
U.S. Cl. D9—337

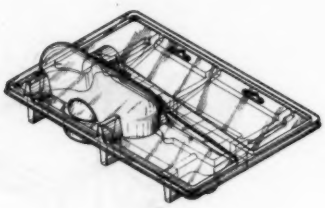
281,225
PILL BOX
Arthur L. Leman, North Attleboro, Mass., assignor to Health Enterprises, Inc., North Attleboro, Mass.
Filed Nov. 1, 1982, Ser. No. 439,054
Term of patent 14 years
U.S. Cl. D9—341



281,226
EGG CONTAINER
Arnaldo Amabili, 7680 Dollier St., St. Leonard, Montreal, Quebec, Canada
Filed May 13, 1983, Ser. No. 494,357
Term of patent 14 years
U.S. Cl. D9—341

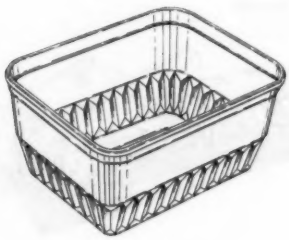


281,227
COMBINED PACKAGING AND DISPLAY CONTAINER
Katsuhiko Okano, Hiroshima, Japan, assignor to Ryobi Limited, Fuchu, Japan
Filed May 25, 1983, Ser. No. 497,850
Term of patent 14 years
U.S. Cl. D9—347

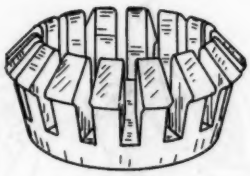


281,228
COMBINED DISPENSING CONTAINER AND CAP
John H. Morgan, Chatham, and John A. Grip, Wayne, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.
Filed Mar. 18, 1983, Ser. No. 476,902
Term of patent 14 years
U.S. Cl. D9—404

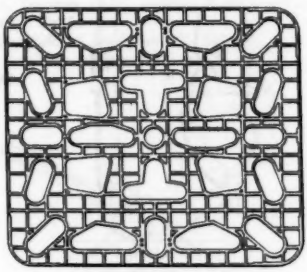
281,229
PACKAGING CONTAINER
Frank S. Tyler, Kent, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 11, 1983, Ser. No. 457,307
Claims priority, application United Kingdom, Jul. 16, 1982, 1007781
The portion of the term of this patent subsequent to Aug. 20, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—425



281,230
HOUSEHOLD MAGNET FOR KITCHEN USE
David V. Olson, 324 IDS Tower, Minneapolis, Minn. 55402, and Walter I. Bieger, 1689 W. Cty. Rd. F, St. Paul, Minn. 55112
Filed Sep. 29, 1982, Ser. No. 428,125
Term of patent 14 years
U.S. Cl. D9—434

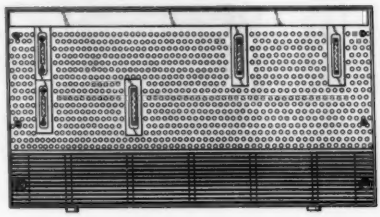


281,231
DIVIDER FOR SEPARATING STACKED ARTICLES
James A. Cochran, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Mar. 17, 1983, Ser. No. 476,382
Term of patent 14 years
U.S. Cl. D9—456

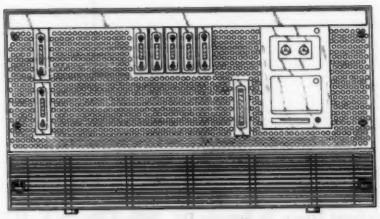


281,232
ANEMOMETRIC WIND VANE
Gary Felix, Box 844, Jerome, Ariz. 86331, and Thomas Rivell, 1598 Blaney Ave., San Jose, Calif. 95129
Filed Oct. 27, 1982, Ser. No. 437,179
Term of patent 14 years
U.S. Cl. D10—59

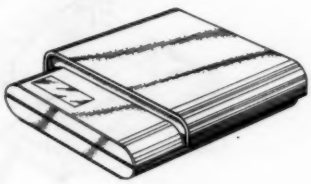
281,233
CIRCUIT BOARD TESTING EQUIPMENT
Kurt Groetzner, Stuttgart, and Bert Wurst, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 19, 1982, Ser. No. 340,793
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 5334
Term of patent 14 years
U.S. Cl. D10—75



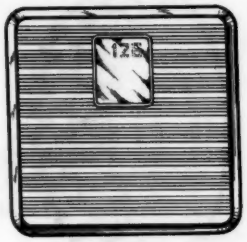
281,234
CIRCUIT BOARD TESTING EQUIPMENT
Kurt Groetzner, Stuttgart, and Bert Wurst, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 19, 1982, Ser. No. 340,795
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 5333
Term of patent 14 years
U.S. Cl. D10—75



281,235
HOUSEHOLD SCALE
Rido Busse, Elchingen, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany
Filed Jan. 10, 1984, Ser. No. 569,675
Term of patent 14 years
U.S. Cl. D10—91

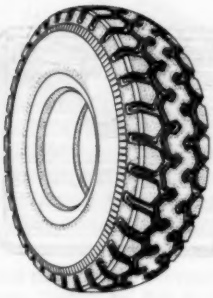


281,236
DIGITAL SCALE
Ronald L. Muller, Old Saybrook, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Jul. 1, 1983, Ser. No. 509,620
Term of patent 14 years
U.S. Cl. D10—92

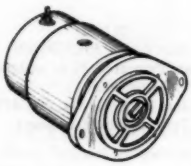


281,237
NOVELTY FIGURINE
Lawrence A. Zusman, Princeton, N.J., assignor to 3 Z Novelty Company, Inc., Princeton, N.J.
Filed Mar. 21, 1983, Ser. No. 477,122
Term of patent 14 years
U.S. Cl. D11—160

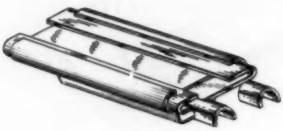
281,238
TIRE
Silvana Hinrichsen, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Oct. 28, 1983, Ser. No. 546,346
Claims priority, application Italy, Apr. 29, 1983, 53268/83[U]
Term of patent 14 years
U.S. Cl. D12—147



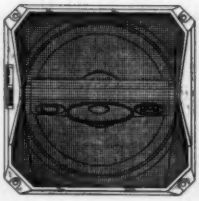
281,239
STARTER MOTOR FOR AN ENGINE
Julius J. Stevens, Fort Deposit, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Jan. 31, 1983, Ser. No. 462,345
Term of patent 14 years
U.S. Cl. D15—5

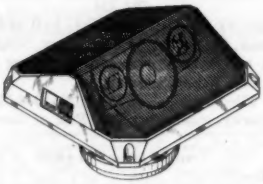


281,240
HOUSING FOR A THERMOSTATIC SWITCH
Omar Givler, North Canton, Ohio, assignor to Portage Electric Products, Inc., North Canton, Ohio
Filed Mar. 16, 1983, Ser. No. 475,720
Term of patent 14 years
U.S. Cl. D13—34

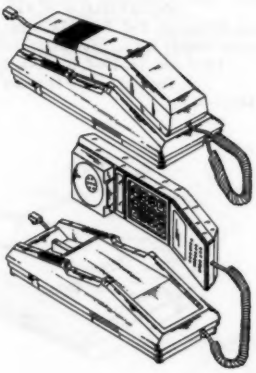


281,241
LOUDSPEAKER
Manabu Kawachi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 29, 1983, Ser. No. 509,075
Claims priority, application Japan, Jan. 7, 1983, 58-134
Term of patent 14 years
U.S. Cl. D14—30



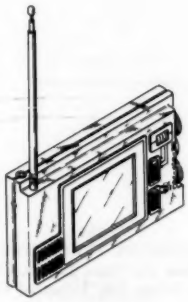


281,242
TELEPHONE
Mordechi Hova, 29 Seaside Dr., Belle Terre, N.Y. 11777
Filed May 31, 1983, Ser. No. 499,301
Term of patent 14 years
U.S. Cl. D14—53

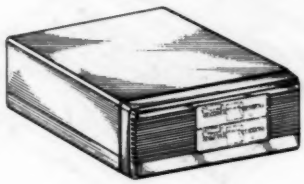


281,243
LARGE BUTTON TELEPHONE
Kenneth Reichenstein, 269-32P Grand Central Pkwy., Floral Park, N.Y. 11005
Filed Jul. 25, 1983, Ser. No. 516,595
Term of patent 14 years
U.S. Cl. D14—53

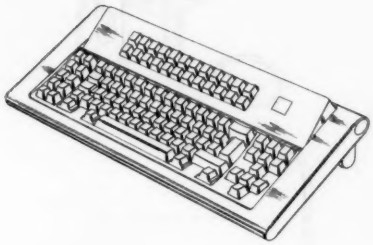
281,244
PORTABLE TELEVISION SET
Yutaka Ohtsu, Yokosuka, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sep. 21, 1983, Ser. No. 534,382
Term of patent 14 years
U.S. Cl. D14—77



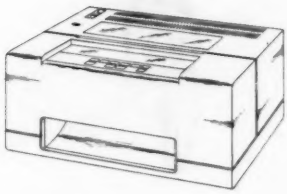
281,245
COMPUTER HOUSING
Barbara K. Lewis, Sunnyvale, Calif., assignor to Qume Corporation, San Jose, Calif.
Filed Apr. 12, 1983, Ser. No. 484,137
Term of patent 14 years
U.S. Cl. D14—100



281,246
KEYBOARD
Louis E. Lenzi, Jr., Rhinebeck, N.Y., assignor to International Business Machines, Armonk, N.Y.
Filed Feb. 18, 1983, Ser. No. 467,977
Term of patent 14 years
U.S. Cl. D14—100



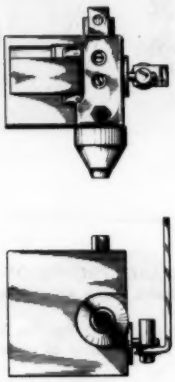
281,247
PASSBOOK PRINTER
Donald F. Lahey, Saratoga, and Dallas G. Molerin, Union City, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 13, 1982, Ser. No. 449,012
Term of patent 14 years
U.S. Cl. D14—111



281,248
COIL TINE FOR A HARROW
Reijo Johde, Inhan Tehtaat, Finland, assignor to Fiskars Oy AB, Helsinki, Finland
Filed Dec. 22, 1982, Ser. No. 452,057
Claims priority, application Finland, Jun. 24, 1982, 560/82
Term of patent 14 years
U.S. Cl. D15—29

281,249
TUBE CUTTER
Lawson H. Nall, Folsom, and Benny T. Hamasaki, Rocklin, both of Calif., assignors to Tri Tool, Inc., Rancho Cordova, Calif.
Filed Jan. 25, 1983, Ser. No. 461,111
Term of patent 14 years
U.S. Cl. D15—129

281,250
COMBINED ELECTRODE DRIVE AND NOZZLE UNIT FOR AN AUTOMATIC AIR CARBON-ARC CUTTING AND GOUGING TORCH
David E. Johnson, Pataskala; Larry A. Aebersold, and Kenneth E. McCall, both of Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Apr. 21, 1983, Ser. No. 487,381
Term of patent 14 years
U.S. Cl. D15—144



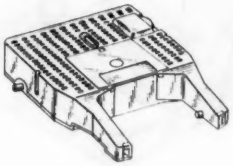
281,251
ELECTRONIC TYPEWRITER
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Mar. 26, 1984, Ser. No. 593,423
Claims priority, application Japan, Dec. 29, 1983, 58-56655
Term of patent 14 years
U.S. Cl. D18—1

281,252
ELECTRONIC TYPEWRITER
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Mar. 26, 1984, Ser. No. 593,530
Claims priority, application Japan, Dec. 29, 1983, 58-56654
Term of patent 14 years
U.S. Cl. D18—1

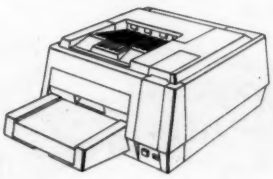
281,253
TYPEWRITER
Cornelius W. Christie, Fulton, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Feb. 6, 1984, Ser. No. 577,407
Term of patent 14 years
U.S. Cl. D18—1

281,254
POS (POINT-OF-SALES) CASH REGISTER
Kunio Akiyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 15, 1982, Ser. No. 434,594
Term of patent 14 years
U.S. Cl. D18—4

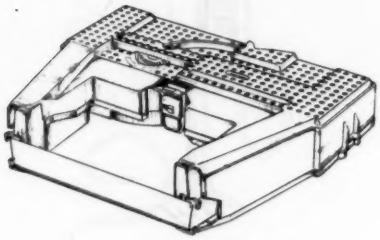
281,255
INK RIBBON CARTRIDGE FOR ELECTRONIC TYPEWRITER
Richard Nibley, Tokyo, and Hiroatsu Kondo, Zushi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 8, 1983, Ser. No. 559,455
Claims priority, application Japan, Jun. 13, 1983, 58-25414
Term of patent 14 years
U.S. Cl. D18—12



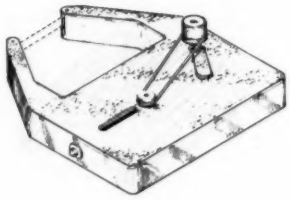
281,256
LASER PRINTER
Toshio Yamamoto, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Apr. 25, 1983, Ser. No. 488,109
Claims priority, application Japan, Oct. 26, 1982, 57-048559
Term of patent 14 years
U.S. Cl. D18—13



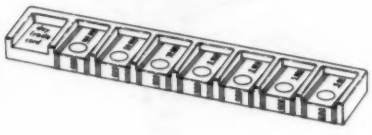
281,257
PRINTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Sep. 7, 1983, Ser. No. 530,039
Claims priority, application Italy, Mar. 7, 1983, 53013-B/83[U]
Term of patent 14 years
U.S. Cl. D18—22



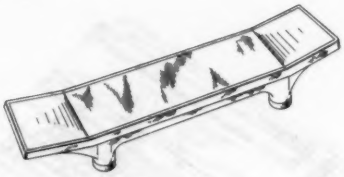
281,258
PRINTER RIBBON CARTRIDGE
William M. Schiffmacher, Boulder, Colo., assignor to Aspen Ribbons, Inc., Lafayette, Colo.
Filed Sep. 19, 1983, Ser. No. 533,119
Term of patent 14 years
U.S. Cl. D18—22



281,259
GAME ACCESSORY HOLDER
Heinz H. Hensley, Dreieich, Fed. Rep. of Germany, assignor to Lillian Hensley Unternehmensberatungs GmbH, Dreieich, Fed. Rep. of Germany
Filed Sep. 9, 1982, Ser. No. 416,251
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 8 MR 560
Term of patent 14 years
U.S. Cl. D21—54



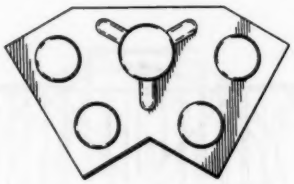
281,260
TOY BALANCE WALKER
Ronald R. Smith, Garden Grove, Calif., assignor to Louis A. Weisenberg and Francis X. LoJacono, both of Westminster, Calif.
Filed May 23, 1983, Ser. No. 497,247
Term of patent 14 years
U.S. Cl. D21—66



281,261
INFLATABLE RIDING TOY
Albert Stubbmann, 746 Dakota Trail, Franklin Lakes, N.J. 07417
Filed Aug. 29, 1983, Ser. No. 527,121
Term of patent 14 years
U.S. Cl. D21—74

281,262
TOY BUILDING BLOCK
Leo S. Volpe, Collingswood, and Michael O. Hirtle, Delran, both of N.J., assignors to Tyco Industries, Inc., Moorestown, N.J.
Filed Oct. 25, 1983, Ser. No. 545,031
Term of patent 14 years
U.S. Cl. D21—108

281,263
TOY BUILDING BLOCK
Leo S. Volpe, Collingswood, and Michael O. Hirtle, Delran, both of N.J., assignors to Tyco Industries, Inc., Moorestown, N.J.
Filed Oct. 25, 1983, Ser. No. 545,036
Term of patent 14 years
U.S. Cl. D21—108

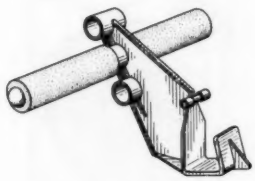


281,264
TOY BOAT OR SIMILAR ARTICLE
John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106, and John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143
Filed Dec. 15, 1982, Ser. No. 450,142
Term of patent 14 years
U.S. Cl. D21—130

281,265
PUPPET
Jan Griffioen, Rijnsburgersingel 1-A, 2312 NA Leiden, Netherlands
Filed Jan. 20, 1983, Ser. No. 459,488
Term of patent 14 years
U.S. Cl. D21—153

281,266
UNICORN DOLL
Diane Insetta, 8444 San Jose Blvd., Jacksonville, Fla. 32217
Filed May 10, 1983, Ser. No. 493,430
Term of patent 14 years
U.S. Cl. D21—165

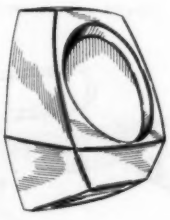
281,267
SIT-UP EXERCISE DEVICE
Gale V. Howard, 2900 E. 40 Hwy., Blue Springs, Mo. 64015
Filed Apr. 14, 1983, Ser. No. 484,843
Term of patent 14 years
U.S. Cl. D21—191



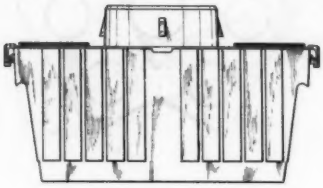
281,268
EXERCISE BENCH
Robert H. Irvine, Mill Valley, and Peter Gutkin, San Francisco, both of Calif., assignors to The Gamefield Concept, Inc., San Francisco, Calif.
Filed Nov. 2, 1983, Ser. No. 548,163
Term of patent 14 years
U.S. Cl. D21—191

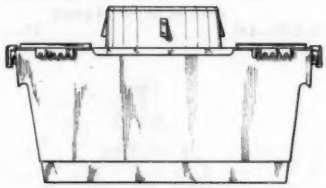
281,269
FLY SWATTER BLADE
Kirk D. Snyder, P.O. Box 78, Reynold, Ind. 47980
Filed Dec. 23, 1982, Ser. No. 452,706
Term of patent 14 years
U.S. Cl. D22—20

281,270
URINAL
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 13, 1983, Ser. No. 457,757
Term of patent 14 years
U.S. Cl. D23—68

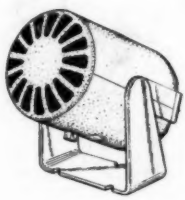


281,271
LINT TRAP
Stephen T. Meyer, Carmel, and C. Rodger Meyer, Noblesville, both of Ind., assignors to Deflecto Corporation, Indianapolis, Ind.
Filed May 11, 1983, Ser. No. 493,612
Term of patent 14 years
U.S. Cl. D23—149

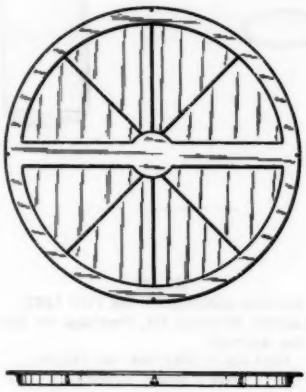




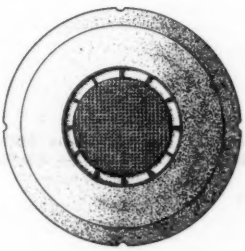
281,272
VEHICLE AIR PURIFIER
Patrick E. Lynch, Jr., Thornton, Colo., assignor to Pyramid Products, Inc., Thornton, Colo.
Filed Jan. 3, 1983, Ser. No. 455,379
Term of patent 14 years
U.S. Cl. D23—149

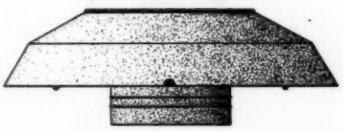


281,273
SELF-CLOSING VENTILATION LOUVER
Kert E. Artwick, Roswell, Ga., assignor to Leslie-Locke, Inc., Atlanta, Ga.
Filed Jan. 6, 1983, Ser. No. 456,306
Term of patent 14 years
U.S. Cl. D23—151

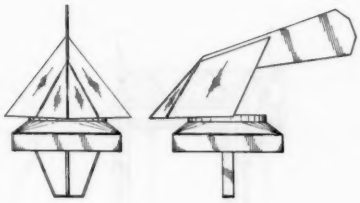


281,274
SOLAR POWERED VENTILATOR
Norman S. Wright, Jr., Lafayette, Calif., assignor to Norman S. Wright & Co., San Francisco, Calif.
Filed Apr. 27, 1983, Ser. No. 489,085
Term of patent 14 years
U.S. Cl. D23—153

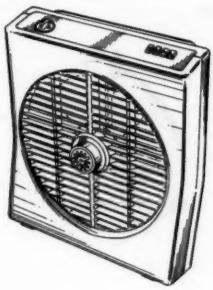




281,275
ROTATABLE CHIMNEY COWL
Timothy A. Feuz, 2007 NE. 104th St., Vancouver, Wash. 98665
Filed Feb. 18, 1983, Ser. No. 467,915
Term of patent 14 years
U.S. Cl. D23—154

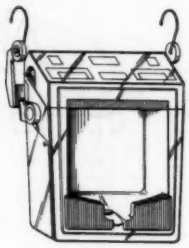


281,276
PORTABLE FAN
Peter B. Farrer, Blackburn, Australia, assignor to Kemtron Properties Pty. Ltd., Melbourne, Australia
Filed Feb. 28, 1983, Ser. No. 470,183
Term of patent 14 years
U.S. Cl. D23—155



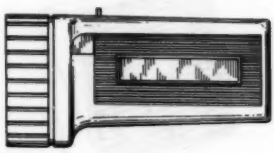
281,277
FAN
James M. Wimsatt, P.O. Box 6855, Reno, Nev. 89513
Filed Jan. 14, 1983, Ser. No. 458,106
Term of patent 14 years
U.S. Cl. D23—155

281,278
ELECTRONIC URINE MONITOR
Larry K. Blankenship, Ramona, and Joseph Manno, La Jolla, both of Calif., assignors to Vitalmetrics, Inc., San Diego, Calif.
Filed Nov. 22, 1982, Ser. No. 443,305
Term of patent 14 years
U.S. Cl. D24—17

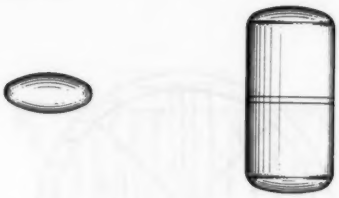


281,279
COMBINED OIL LAMP, VASE OR SIMILAR ARTICLE
David R. Perkins, Manchester, Mass., assignor to Glass Dimensions, Inc., Magnolia, Mass.
Filed Aug. 11, 1983, Ser. No. 522,195
Term of patent 14 years
U.S. Cl. D26—10

281,280
COMPACT LIGHT
John F. Schosser, New Fairfield; Roger K. Gleason, Stratford, both of Conn.; Charles M. Dole, Purdys, N.Y.; Max Us, Bridgeport, Conn., and Bradley Burke, Dundee, N.Y., assignors to Duracell Inc., Bethel, Conn.
Filed Mar. 7, 1983, Ser. No. 473,164
Term of patent 14 years
U.S. Cl. D26—46

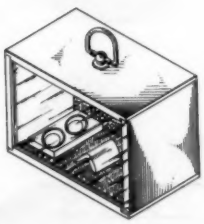


281,281
FRAGRANCE CONTAINER
Norma Matalon, 445 E. 77th St., New York, N.Y. 10021
Filed Sep. 20, 1982, Ser. No. 419,950
Term of patent 14 years
U.S. Cl. D28—5



281,282
RAZOR ASSEMBLY OR THE LIKE
Wayne P. Lazarus, Fernleigh Rd., Fernleigh via Ballina, New South Wales, Australia
Filed Jul. 5, 1983, Ser. No. 510,585
Term of patent 14 years
U.S. Cl. D28—47

281,283
INSECT CAGE
Monty N. Cazier, 2253 Linda St., Saginaw, Mich. 48603
Filed Feb. 28, 1983, Ser. No. 470,584
Term of patent 14 years
U.S. Cl. D30—1

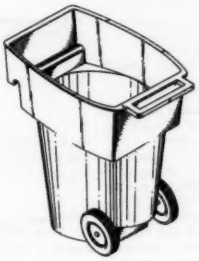


281,284

REFUSE CONTAINER

Edward J. Reuter, Excelsior, Minn., assignor to Reuter, Inc., Hopkins, Minn.

Filed Oct. 12, 1983, Ser. No. 541,108
Term of patent 14 years
U.S. Cl. D34—5



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF NOVEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Menarini S.a.S.: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, 4,551,451, Cl. 514-217.000.

A. Nattermann & Cie GmbH: *See*—
Hilboll, Gerd; Doppelfeld, Ille-Stephanie; and Prop, Gerrit, 4,551,455, Cl. 514-252.000.

A-Z International Tool Company: *See*—
Kagler, Edmond, Jr., 4,550,781, Cl. 166-340.000.

ab der Halden, Charles H.; and Berenguier, Pierre H., to Societe Anonyme de Telecommunications. System for phasing digital trains and application thereof to the switching of said trains. 4,551,845, Cl. 375-40.000.

Abe, Seiko: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,550,744, Cl. 137-80.000.

Abe, Toshio; and Sakurai, Terushige, to Kabushiki Kaisha Komatsu Seisakusho. Press machine. 4,550,588, Cl. 72-441.000.

Abou, Shouji: *See*—
Matsuo, Kenji; and Abou, Shouji, 4,551,683, Cl. 328-167.000.

Ackeret, Peter, to Licinvest AG. Picture viewer. 4,550,516, Cl. 40-513.000.

Acuson: *See*—
Maslak, Samuel H.; and Wright, John N., 4,550,607, Cl. 73-626.000.

Adapa, Satya N.: *See*—
O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., 4,551,348, Cl. 426-639.000.

Addis, John L.: *See*—
Andrews, Roland E.; and Addis, John L., 4,551,636, Cl. 307-264.000.

Adolphi, Heinrich: *See*—
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,551,448, Cl. 514-130.000.

Adsit, Gordon H., to Industrial Refuse Sales, Inc. Refuse container. 4,550,849, Cl. 220-71.000.

Advanced Evacuation Systems: *See*—
Forrest, William E., 4,550,801, Cl. 182-7.000.

Advanced Micro Devices, Inc.: *See*—
Varadarajan, Hemmige D., 4,551,638, Cl. 307-455.000.

Aerojet-General Corporation: *See*—
Moore, Donald W.; and Verstraete, Rick A., 4,551,814, Cl. 364-716.000.
Moore, Donald W.; and Verstraete, Rick A., 4,551,815, Cl. 364-716.000.

Aerospace Corporation, The: *See*—
Gaulin, Camille A.; and Katzman, Howard A., 4,551,487, Cl. 523-215.000.

Aerts, Armand, to Du Pont de Nemours, E. I., and Company. Polyester coating composition. 4,551,492, Cl. 524-40.000.

Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Method of correcting radiation image read-out error. 4,551,626, Cl. 250-327.200.

Agawa, Setsuo: *See*—
Beppu, Masaru; Agawa, Setsuo; Hazeyama, Takeshi; and Nashimoto, Toshiyuki, 4,551,240, Cl. 209-143.000.

Agency of Industrial Science and Technology: *See*—
Urasaki, Takanori, 4,551,508, Cl. 525-507.000.

Agrawal, Balkishan, to Union Carbide Corporation. Method for controlling slag chemistry in a refining vessel. 4,551,175, Cl. 75-513.000.

Ai, Daniel K.; and Yu, Ho, to Aluminum Company of America. Roll caster apparatus having nozzle tip assembly with novel spacer member. 4,550,766, Cl. 164-428.000.

Ai, Daniel K.: *See*—
Yu, Ho; and Ai, Daniel K., 4,550,767, Cl. 164-428.000.

Aiba, Kazumi: *See*—
Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, 4,550,480, Cl. 29-156.40R.

Aicher, Frederick T.; Martin, James R., Sr.; and Flanagan, William T., to NDM Corporation. Electrosurgical electrode connector. 4,550,961, Cl. 339-14.00R.

Aidn, Martin, to Siemens Aktiengesellschaft. Polarized electromagnetic relay. 4,551,698, Cl. 335-78.000.

Air Products and Chemicals, Inc.: *See*—
Paterson, Alan J. F., 4,551,091, Cl. 432-23.000.

Aisin Warner Kabushiki Kaisha: *See*—
Kawamoto, Mutsumi, 4,550,629, Cl. 74-689.000.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece with a sound generator. 4,551,029, Cl. 368-273.000.

Aizawa, Koki; and Haeno, Akira, to Pioneer Electronic Corporation. Level shifting circuit. 4,551,642, Cl. 307-552.000.

Ajimine, Akio: *See*—
Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, 4,551,849, Cl. 381-86.000.

Akada, Yasuaki: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,550,993, Cl. 354-402.000.

Akahane, Masao: *See*—
Takeda, Koji; Akahane, Masao; Mukaiyama, Fumiaki; and Kudo, Yasuhiko, 4,551,846, Cl. 375-82.000.

Akamatsu, Norio; and Toyosu, Yasuhiro. Electrode for an electrocardiograph. 4,550,735, Cl. 128-639.000.

Akisue, Osamu; Yamada, Teruaki; Ueda, Shigeru; Tokunaga, Yoshikuni; and Yamada, Masato, to Nippon Steel Corporation. Process for producing deep-drawing cold rolled steel sheets and strips. 4,551,182, Cl. 148-12.00C.

Akiyama, Shoichi; and Kondo, Mikio, to Matsushita Electric Works, Ltd. Infrared-type intrusion detector. 4,551,711, Cl. 340-567.000.

Akzo N.V.: *See*—
Savage, David S.; and Redpath, James, 4,551,479, Cl. 514-657.000.

Albany International Corporation: *See*—
Bolton, Joseph A.; and Salls, David J., 4,551,202, Cl. 162-198.000.

Alber, Ulrich. Hand-operated cart. 4,550,924, Cl. 280-5.280.

Albert Bocker GmbH & Co. KG: *See*—
Bocker, Albert, 4,550,806, Cl. 187-10.000.

Albright, Jay D.: *See*—
Dusza, John P.; and Albright, Jay D., 4,551,530, Cl. 544-281.000.

Alcan International Limited: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and Rogers, Charles J., 4,551,218, Cl. 204-240.000.

Alchemia Ltd. Partnership: *See*—
Krumme, John F.; and Hodgson, Darel E., 4,550,870, Cl. 227-19.000.

Alesandrini, Carlo G., Jr.; and Nady, Louie A., to Stauffer Chemical Company. Method for conducting a chemical process in a packed multi-tubular reactor. 4,551,325, Cl. 423-488.000.

Allen, David L. Spherical maze game apparatus. 4,550,912, Cl. 273-113.000.

Allen, James E. Infant cradle assembly. 4,550,456, Cl. 5-98.00B.

Allied Corporation: *See*—
Bartholomew, Roy E., 4,550,953, Cl. 303-15.000.
Haylock, John C.; and Vanderkooi, Nicholas, Jr., 4,551,507, Cl. 525-437.000.
Kavesh, Sheldon; and Prevorsek, Dusan C., 4,551,296, Cl. 264-177.00F.
Mathew, Chempolil T.; and Ulmer, Harry E., 4,551,323, Cl. 423-387.000.
Mathew, Chempolil T.; and Ulmer, Harry E., 4,551,324, Cl. 423-387.000.
Meeder, Edward A., Jr., 4,551,765, Cl. 358-248.000.
Oxenrider, Bryce C., 4,551,519, Cl. 528-296.000.
Remus, Casimer F., 4,550,630, Cl. 74-800.000.
Riches, Arthur J.; and Mitchell, Brian, 4,550,967, Cl. 339-88.00R.
Spangler, Glenn E.; and Cox, John N., 4,551,624, Cl. 250-287.000.

Alpen Dairy Foods Pty. Limited: *See*—
Kilroy, Stanley A. R., 4,551,346, Cl. 426-602.000.

Alpha Corporation Of Tennessee: *See*—
Bayha, Charles E., 4,551,489, Cl. 523-501.000.

Alps Electric Co., Ltd.: *See*—
Koike, Hiroshi; Takeuchi, Shuhei; and Miyajima, Mikio, 4,551,033, Cl. 400-308.000.

Aluminum Company of America: *See*—
Ai, Daniel K.; and Yu, Ho, 4,550,766, Cl. 164-428.000.
Yu, Ho; and Ai, Daniel K., 4,550,767, Cl. 164-428.000.

Alvarez, Robert: *See*—
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,551,459, Cl. 514-267.000.

Amano, Masatoshi: *See*—
Honma, Ichiro; Koyama, Arata; Amano, Masatoshi; and Takumi, Nobusuke, 4,551,327, Cl. 423-594.000.

Amata, Mario A., to Lincoln Electric Company, The. Tubular welding electrode. 4,551,610, Cl. 219-146.300.

Amax Inc.: *See*—
Beckstead, Leo W.; Havelick, Linn D.; and Hogsett, Robert F., 4,551,314, Cl. 423-54.000.
Sabacky, Bruce J.; and Hepworth, Malcolm T., 4,551,313, Cl. 423-59.000.

Ambient Energy Design: *See*—
Archer, John, 4,550,759, Cl. 160-176.00R.

Ambrose, Richard J.: *See*—
Hsich, Henry S. Y.; and Ambrose, Richard J., 4,551,807, Cl. 364-473.000.

Amdahl Corporation: *See*—
Amdahl, Gene M.; Hanson, Donald L.; Kreuzenstein, Ronald K.; Roshon-Larsen, Gwynne L.; and Woffinden, Gary A., 4,551,797, Cl. 364-200.000.

Amdahl, Gene M.; Hanson, Donald L.; Kreuzenstein, Ronald K.; Roshon-Larsen, Gwynne L.; and Woffinden, Gary A., to Amdahl Corporation. Apparatus for reverse translation. 4,551,797, Cl. 364-200.000.

Amemiya, Yoichi; Ishida, Hiroshi; Takekoshi, Yashitaka; and Ushiyama, Shigeyuki, to Fanuc Ltd. Pulse coder using magnetoresistance elements having an improved z-phase signal pattern. 4,551,676, Cl. 324-208.000.

American Can Company: *See*—
Eckstein, John P., 4,551,371, Cl. 428-36.000.

American Cyanamid Company: *See*—
Dusza, John P.; and Albright, Jay D., 4,551,530, Cl. 544-281.000.
Gotthard, George, 4,551,266, Cl. 252-400.00R.
Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., 4,551,533, Cl. 546-35.000.

American Home Products Corporation: *See*—
Greenspan, George, 4,551,429, Cl. 435-68.000.
Sulkowski, Theodore S.; Silver, Paul J.; Mascitti, Albert A.; and Bender, Reinhold H. W., 4,551,534, Cl. 546-123.000.
Wei, Peter H. L.; and Carlson, Richard P., 4,551,538, Cl. 548-367.000.

American Hospital Supply Corporation: *See*—
Mai, Khuong H. X.; and Patil, Ghanshyam, 4,551,526, Cl. 544-163.000.
Mai, Khuong H. X.; and Patil, Ghanshyam, 4,551,537, Cl. 546-330.000.
Zegers de Beyl, Rene H.; and Coble, Stephen J., 4,551,133, Cl. 604-66.000.

American Multimedia, Inc.: *See*—
Farrow, Robert I.; and Clark, Richard L., 4,551,190, Cl. 156-159.000.

American Standard Inc.: *See*—
Edwards, John C.; and Ford, Russell A., 4,550,775, Cl. 165-111.000.
Emmel, David G., 4,550,889, Cl. 246-28.00R.
Rumsey, Steven C., 4,550,811, Cl. 188-170.000.

Ames, Theodore; and Brown, Vernon E., Jr., to Glacier Products. Apparatus for manufacturing soft ice cream and the like. 4,551,025, Cl. 366-144.000.

AMF Inc.: *See*—
Bains, Elizabeth M., 4,550,605, Cl. 73-622.000.
Fehrenkamp, William; Pater, Arnold R.; and Brummel, Arthur D., 4,551,824, Cl. 367-76.000.
Storace, Anthony; and Ketchman, Jeffery, 4,551,806, Cl. 364-473.000.

AMP Incorporated: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,550,960, Cl. 339-14.00R.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,550,959, Cl. 339-9.00E.
Romak, Paul E., 4,550,972, Cl. 339-256.00R.

Anders, James V.; Anderson, Thomas W.; Geiger, Daniel D.; and Turnpaugh, George F., to AT&T Bell Laboratories. Circuit for maintaining the DC voltage on an electrically isolated telecommunication line at a reference level. 4,551,670, Cl. 323-281.000.

Andersen, Robert P.: *See*—
Duga, Robert J.; Kulig, Constantine W.; Doughty, Robert L.; Douglas, Robert J.; and Andersen, Robert P., 4,551,163, Cl. 65-129.000.

Anderson, Carl J., to International Business Machines Corporation. Look-back analog to digital converter. 4,551,704, Cl. 340-347.0AD.

Anderson, Carl P., to Ricoh Company Ltd. Electrophotographic copying apparatus including transfer hold-down pump. 4,550,999, Cl. 355-3.0TR.

Anderson, Robert D., to Honeywell Inc. Programmable integrated circuit AC resistor network. 4,551,705, Cl. 340-347.0DA.

Anderson, Thomas W.: *See*—
Anders, James V.; Anderson, Thomas W.; Geiger, Daniel D.; and Turnpaugh, George F., 4,551,670, Cl. 323-281.000.

Ando, Haruhisa: *See*—
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.

Ando, Hisashi: *See*—
Watanabe, Ryuji; Ando, Hisashi; Kuniya, Keiichi; and Kurosawa, Yukio, 4,551,596, Cl. 200-144.00B.

Andres, Rudolf; Grantz, Helmut; Muenzel, Wolf-Dietrich; and Odebrecht, Wolfgang, to Daimler-Benz Aktiengesellschaft. Surface heating body for vehicles. 4,550,774, Cl. 165-104.210.

Andrews, Roland E.; and Addis, John L., to Tektronix, Inc. Wide bandwidth signal coupling circuit having a variable voltage-level shift from input to output. 4,551,636, Cl. 307-264.000.

Anechoic Systems Company, Inc.: *See*—
Swartz, Henry D.; and Miller, Alan H., 4,550,798, Cl. 181-201.000.

Angelo Guala S.p.A.: *See*—
Guala, Piergiacomo, 4,550,845, Cl. 215-252.000.

Angiomedics, Inc.: *See*—
Fletcher, Bruce W.; Rydell, Mark A.; and Reese, Edward W., 4,551,292, Cl. 264-139.000.

Annarelli, Dennis C.: *See*—
Dominiani, Frank J., Jr.; and Annarelli, Dennis C., 4,551,320, Cl. 423-321.00R.

Annunziata, Eugene J.; and Stammely, Thomas E., to International Business Machines Corp. Terminal disconnect and media wire fault detect mechanism. 4,551,671, Cl. 324-51.000.

Ansel, David S.: *See*—
Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., 4,551,350, Cl. 427-389.900.

Antognini, Luciano; and Guerin, Yves, to ETA S.A. Fabriques D'Ebauches. Method of and a device for controlling a stepping motor. 4,551,665, Cl. 318-696.000.

Anton/Bauer, Inc.: *See*—
Corrigan, John J., 4,550,968, Cl. 339-91.00R.

Aoki, Junji: *See*—
Uematsu, Hiroaki; and Aoki, Junji, 4,551,222, Cl. 204-417.000.

Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Herbicidal 2-(1,3,5-1H-triazin-2-one)-tetrahydrobenzothiazole derivatives, and compositions therefor. 4,551,168, Cl. 71-90.000.

Aoki, Masakazu: *See*—
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.

Aoki, Matsuyuki; and Tanaka, Shuji, to Fuji Xerox Co., Ltd. Developer density detecting apparatus. 4,551,002, Cl. 355-3.0DD.

Aossey, Joseph W. Pet door mat alarm. 4,551,713, Cl. 340-666.000.

Apple, James: *See*—
Permut, Ronald; Cope, Robert; Apple, James; Epina, August P.; and Munro, Frederick G., 4,550,884, Cl. 242-189.000.

Appleton Papers Inc.: *See*—
Miller, Robert E.; and Vervacke, Steven L., 4,551,739, Cl. 346-216.000.

Apri, Edward W. Momentum responsive vehicle shoulder harness latch. 4,550,951, Cl. 297-480.000.

Arabori, Hideo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording media and process of producing them. 4,551,778, Cl. 360-131.000.

Arakawa, Yoshihiro: *See*—
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.

Arbabian, Morteza. Waste water heat recovery apparatus. 4,550,771, Cl. 165-47.000.

Arcari, Giuliana: *See*—
Doria, Gianfederico; Passarotti, Carlo; Arcari, Giuliana; and Buttinoni, Ada, 4,551,457, Cl. 514-258.000.

Archant Limited: *See*—
Inman, Roger, 4,550,632, Cl. 76-86.000.

Archer, John, to Ambient Energy Design. Apparatus for simultaneously closing and opening a group of blinds. 4,550,759, Cl. 160-176.00R.

Arendt, Paul N.; and Valencia, Vance I., to Jersey Nuclear-Avco Isotopes, Inc. Demodulation of vapor density. 4,551,844, Cl. 373-12.000.

Argyo, Wilhelm, to Siemens Aktiengesellschaft. Layer containing carbon and a method and apparatus for producing such a layer. 4,551,216, Cl. 204-192.00C.

Armco Inc.: *See*—
Lawson, John E., 4,550,782, Cl. 166-382.000.

Armstrong, Richard G.: *See*—
Hoke, Merle C.; Armstrong, Richard G.; and Penn, James E., 4,551,792, Cl. 362-362.000.

Armstrong World Industries, Inc.: *See*—
Olcott, Robert S., Jr., 4,550,478, Cl. 29-130.000.

Arndt, Alfred: *See*—
Rutty, John G.; and Arndt, Alfred, 4,551,854, Cl. 455-78.000.

Arney, Jonathan S.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,551,407, Cl. 430-138.000.

Asahi Glass Company, Ltd.: *See*—
Oda, Yoshio; and Morimoto, Takeshi, 4,551,220, Cl. 204-294.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ogawa, Kimiaki, 4,551,764, Cl. 358-228.000.

Asahi Optical Co., Ltd.: *See*—
Tachihara, Satoru, 4,550,987, Cl. 350-454.000.

Asaka, Urataro; Kanai, Shigeo; Tanaka, Yasuhiro; and Iwamoto, Kazuya, to Honda Giken Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Honda Rokku. Air pump apparatus. 4,551,074, Cl. 417-366.000.

Asano, Shoji: *See*—
Kanayama, Kiyoshi; and Asano, Shoji, 4,550,635, Cl. 82-4.00C.

Asanuma, Mari, to International Paper Company. Semi-rigid container with a bottom of improved stability. 4,550,826, Cl. 206-259.000.

ASE (UK) Limited: *See*—
Patterson, Michael, 4,550,933, Cl. 280-808.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,551,511, Cl. 526-204.000.
Hettinger, William P., Jr., 4,551,234, Cl. 208-179.000.

Kovach, Stephen M.; and Palmer, James L., 4,551,231, Cl. 208-120.000.
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., to AMP Incorporated. Shielded backplane assembly. 4,550,960, Cl. 339-14.00R.
ASM Assembly Automation Ltd.: *See*—
Chan, Lo K.; Tang, Yui K.; and Chang, Jui, 4,550,871, Cl. 228-4.500.
Asmussen, Frithjof; Sotobayashi, Hideto; Chen, Jiang-Tsun; and Schnabel, Wolfram, to Max-Planck-Gesellshaft zur Forderung der Wissenschaften e.V. Positive resist material. 4,551,414, Cl. 430-270.000.
Aston, Geoffrey W.; Smith, Susan; Chapman, Paul; and Barker, Howard A., to Redland Technology Limited. Boards. 4,551,384, Cl. 428-312.600.
AT&T Bell Laboratories: *See*—
Anders, James V.; Anderson, Thomas W.; Geiger, Daniel D.; and Turnpaugh, George F., 4,551,670, Cl. 323-281.000.
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,551,416, Cl. 430-311.000.
Cox, Richard V.; and Jayant, Nuggehally S., 4,551,580, Cl. 179-1.50S.
Doughty, Carolyn A., 4,551,581, Cl. 179-2.00A.
Gannett, Joel W., 4,551,838, Cl. 371-25.000.
Levinson, Frank H.; and Schweizer, Rudolph C., 4,550,975, Cl. 350-96.180.
Miller, Gabriel L., 4,551,674, Cl. 324-158.00R.
Turner, Jonathan S., 4,551,833, Cl. 370-60.000.
AT&T Technologies, Inc.: *See*—
Loesch, Robert P., 4,551,185, Cl. 148-150.000.
Atago, Takeshi: *See*—
Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, 4,550,705, Cl. 123-488.000.
Ateliers de Constructions Electriques de Charleroi (ACEC)-Societe Anonyme: *See*—
Neumann, Jacques, 4,551,101, Cl. 434-55.000.
Ateliers des Charmilles S.A.: *See*—
Marendaz, Georges-Andre , 4,551,809, Cl. 364-474.000.
Atlantic Richfield Company: *See*—
Schlademan, James A., 4,551,388, Cl. 428-355.000.
Taylor, Paul D.; and Mocella, Michael T., 4,551,553, Cl. 568-311.000.
Wakefield, G. Felix; Bender, David L.; and Rea, Samuel N., 4,551,291, Cl. 264-104.000.
Yuill, William A., 4,551,312, Cl. 423-53.000.
Atsumi, Shinya: *See*—
Iwashita, Takashi; Atsumi, Shinya; and Nakahama, Ryoji, 4,551,104, Cl. 440-56.000.
Aubert, Jean-Daniel; and Fornerod, Andre , to Cybelec S.A. Device for forming part of a press brake for determining automatically the thickness of the sheet. 4,550,586, Cl. 72-389.000.
Azenov, Ivan I.; Bren, Viktor G.; Padalka, Valentin G.; Sablev, Leonid P.; Stupak, Rimma I.; and Khoroshikh, Vladimir M. Vacuum-arc plasma apparatus. 4,551,221, Cl. 204-298.000.
B.S.P. Packaging Systems di Pattarozzi D. & C.s.a.s.: *See*—
Pattarozzi, Domenico, 4,551,052, Cl. 414-81.000.
Babb, John H., Jr.; and Marotto, Robert A., to Kysor Industrial Corporation. Security strike assembly. 4,550,939, Cl. 292-340.000.
Bacardit, Juan S.: *See*—
Coil, Juan V.; Bacardit, Juan S.; and Bofill, Joaquim F., 4,550,566, Cl. 60-554.000.
Bachman, Joseph L., Jr.: *See*—
Johnson, A. David, Jr.; Bachman, Joseph L., Jr.; Ginther, George E., Sr.; Zimmermann, Charles E.; and Johnson, Albert D., Sr., 4,551,126, Cl. 493-453.000.
Bailey, David C.: *See*—
Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., 4,551,829, Cl. 370-3.000.
Bains, Elizabeth M., to AMF Inc. Hopping mechanism for pipe and coupling inspection probe. 4,550,605, Cl. 73-622.000.
Bair, Kenneth W., to Burroughs Wellcome Co. Triphenylene derivatives. 4,551,282, Cl. 260-501.180.
Baker, Bart M.: *See*—
Baker, Stanley Z.; Baker, Bart M.; and Baker, Benjamin H., 4,550,525, Cl. 43-131.000.
Baker, Benjamin H.: *See*—
Baker, Stanley Z.; Baker, Bart M.; and Baker, Benjamin H., 4,550,525, Cl. 43-131.000.
Baker, Hugh W. B.; and White, Robert, to Gillette Company, The. Marking instrument. 4,551,035, Cl. 401-104.000.
Baker, Hugh W. B.; and Whiting, Graham J., to Gillette Company, The. Writing instrument tip. 4,551,038, Cl. 401-265.000.
Baker, Stanley Z.; Baker, Bart M.; and Baker, Benjamin H., to J. T. Eaton & Company, Inc. Tamper proof rodent bait station. 4,550,525, Cl. 43-131.000.
Balashova, Taisia M.: *See*—
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.
Balcke-Durr Aktiengesellschaft: *See*—
Trage, Burghard; Hintzen, Franz-Josef; and Leitz, Richard, 4,550,570, Cl. 60-693.000.
Baldwin, Arthur; and Baldwin, Mark. Portable tool box. 4,550,828, Cl. 206-349.000.
Baldwin, Mark: *See*—
Baldwin, Arthur; and Baldwin, Mark, 4,550,828, Cl. 206-349.000.
Ballmann, Fred A.; and Cooper, James M. Face mask and dispenser assembly. 4,550,856, Cl. 221-63.000.
Balz, Werner: *See*—
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.
Bang & Olufsen A/S: *See*—
Mathiassen, Herluf S., 4,551,584, Cl. 179-156.00R.
Banko, Victor F.: *See*—
Talish, Roger J.; and Banko, Victor F., 4,550,714, Cl. 128-1.500.
Bankston, Benjamin F., to United States of America, National Aeronautics and Space Administration. Apparatus and method for inspecting a bearing ball. 4,551,677, Cl. 324-226.000.
Banton, Martin E., to Xerox Corporation. Image annotator for use with printing and coping machines. 4,551,008, Cl. 355-14.00E.
Barall, Heinz, to Hibar Systems Limited. Fluid pressure operated actuator. 4,551,072, Cl. 417-318.000.
Bardos, Andrew M.: *See*—
Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., 4,551,829, Cl. 370-3.000.
Barho, Hans; and Denz, Helmut, to Robert Bosch GmbH. Multi-cylinder internal combustion engine having disconnectable groups of cylinders. 4,550,704, Cl. 123-481.000.
Barker, Dale E.; Bettle, Griscom, III; and Van Coney, Robert H., to Procter & Gamble Company, The. Liquid product pouring and measuring package with self draining feature. 4,550,862, Cl. 222-109.000.
Barker, Howard A.: *See*—
Aston, Geoffrey W.; Smith, Susan; Chapman, Paul; and Barker, Howard A., 4,551,384, Cl. 428-312.600.
Barlics, John J. Trivet. 4,550,894, Cl. 248-346.000.
Barnabeo, Austin E., to Union Carbide Corporation. Water curable, azide sulfonyl silane modified ethylene polymers. 4,551,504, Cl. 525-333.900.
Barnes, Robert S.: *See*—
Campbell, James R., 4,551,604, Cl. 219-78.120.
Barnum, Charly, to Kesser Electronics International, Inc. Lighting control system and method. 4,551,654, Cl. 315-159.000.
Barsukov, Anatoly V.: *See*—
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.
Barth, Hans; and Prokopp, Manfred, to Riba-Pruftechnik GmbH. Testing arrangement for printed circuit boards. 4,551,673, Cl. 324-158.00F.
Bartholmei, Peter: *See*—
Hoheisel, Peter; and Bartholmei, Peter, 4,550,833, Cl. 206-527.000.
Bartholomew, Roy E., to Allied Corporation. Electro-pneumatic control for a vehicle fluid pressure braking system. 4,550,953, Cl. 303-15.000.
BASF Aktiengesellschaft: *See*—
Blinne, Gerd; and Muench, Volker, 4,551,493, Cl. 524-89.000.
Bott, Kaspar; Kaibel, Gerd; Hartmann, Horst; Irnich, Rudolf; and Buelow, Horst, 4,551,208, Cl. 203-60.000.
Dockner, Toni; and Krug, Herbert, 4,551,528, Cl. 544-242.000.
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,551,318, Cl. 423-265.000.
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,551,448, Cl. 514-130.000.
Straub, Ferdinand; Sanner, Axel; Seib, Karl; and Lang, Siegfried, 4,551,512, Cl. 526-264.000.
Tschang, Chung-Ji; and Marcinowski, Stefan, 4,551,482, Cl. 521-53.000.
Wagner, Eckhart; Volkamer, Klaus; Hefner, Werner; and Wagner, Ulrich, 4,551,158, Cl. 55-46.000.
Bass, Eric. Exercise device for use in tank containing water. 4,551,108, Cl. 441-116.000.
Basseches, Mark T. Binder assembly with randomly removable leaves. 4,551,039, Cl. 402-60.000.
Batina, William P.; and White, Robert M., to Cordis Corporation. Acquisition circuit for cardiac pacer. 4,550,731, Cl. 128-419.0PT.
Battenfeld Extrusionstechnik GmbH: *See*—
Schwab, Erwin; Parisi, Graziano; and Pander, Peter, 4,551,289, Cl. 264-23.000.
Batty, John R., Jr.; and Slocum, Chester D., to Cordis Corporation. System and process for enabling a predefined function within an implanted device. 4,550,732, Cl. 128-419.0PG.
Baugher, Stuart W., to Chevron Research Company. Steam tube yoke and hanger assembly insulation cover. 4,550,690, Cl. 122-510.000.
Bayer Aktiengesellschaft: *See*—
Brassat, Bert; Buysch, Hans-Josef; Hermann, Karl H.; and Haupt, Heinrich, 4,551,495, Cl. 524-94.000.
Brinkwerth, Wolfgang; Huffer, Wolfgang; Raue, Roderich; Schieder, Rudolf; and Telle, Helmut, 4,551,265, Cl. 252-301.170.
Schellhammer, Karl-Wolfgang; Rottmaier, Ludwig; Merten, Rudolf; and Schimmel, Ulrich, 4,551,263, Cl. 252-186.390.

Wehinger, Egbert; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,551,467, Cl. 514-334.000.

Bayerische Motoren Werke AG: *See—*
Bourauel, Fritz; and Weishaupt, Walter, 4,551,703, Cl. 340-52.00D.

Bayha, Charles E., to Alpha Corporation Of Tennessee. Emulsions of dicyclopentadiene containing polyesters. 4,551,489, Cl. 523-501.000.

BBC Brown, Boveri & Company, Limited: *See—*
Canay, Muzaffer, 4,551,780, Cl. 361-113.000.

Beck, Richard, Jr., to Sundstrand Corporation. Thin valve plate for a hydraulic unit. 4,550,645, Cl. 91-499.000.

Becker, Erwin; Ehrfeld, Wolfgang; Fritz, Wolfgang; Steinhaus, Harald; and Bley, Peter, to Kernforschungszentrum Karlsruhe GmbH. Method for separating light additive gas in separating nozzle cascades. 4,551,157, Cl. 55-17.000.

Becker, John H. Composite horizontally or vertically split casing with variable casing ends. 4,551,065, Cl. 415-219.00R.

Beckman Instruments, Inc.: *See—*
Durbin, Dennis, 4,551,715, Cl. 340-671.000.

Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, to Union Carbide Corporation. Shirred casing article. 4,550,471, Cl. 17-1.00R.

Beckstead, Leo W.; Havelick, Linn D.; and Hogsett, Robert F., to Amax Inc. Process for improving solvent extraction operation using two mixers. 4,551,314, Cl. 423-54.000.

Behnke, Horst; Michaud, Horst; Seeholzer, Joseph; and Solansky, Svatoplug, to SKW Trostberg Aktiengesellschaft. Nitrogen fertilizer and process for its manufacture. 4,551,166, Cl. 71-30.000.

Behr-Thomson Dehnstoffregler GmbH: *See—*
Saur, Roland, 4,550,693, Cl. 123-41.100.

Beitler, Brad D.: *See—*
Haeber, John A.; Rains, John K.; Beitler, Brad D.; and Kukuchek, George S., 4,550,936, Cl. 285-26.000.

Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., to Inco Limited. Process for obtaining a composite material and composite material obtained by said process. 4,551,184, Cl. 148-127.000.

Bell, John R.; Scoville, Robert E.; and Whitt, Joade, to National Steel Corporation. Shroud tube manipulating and supporting apparatus. 4,550,867, Cl. 222-607.000.

Bell, Vivien L., to Minnesota Mining and Manufacturing Company. Recording element for optical data storage. 4,551,413, Cl. 430-270.000.

Belmont Textile Machinery Company: *See—*
Niederer, Kurt W., 4,550,880, Cl. 242-18.0DD.

Beltone Electronics Corporation: *See—*
Moy, Alexander, 4,551,607, Cl. 219-121.0LJ.

Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I. Joining element for fixation of bone tissues. 4,550,723, Cl. 128-92.00B.

Belz, Roland K. Composite packaging material and process for making same. 4,551,369, Cl. 428-36.000.

Bendell, Sidney L., to RCA Corporation. Television camera with solid-state imagers cooled by a thermal servo. 4,551,760, Cl. 358-213.000.

Bender, David L.: *See—*
Wakefield, G. Felix; Bender, David L.; and Rea, Samuel N., 4,551,291, Cl. 264-104.000.

Bender, Reinhold H. W.: *See—*
Sulkowski, Theodore S.; Silver, Paul J.; Mascitti, Albert A.; and Bender, Reinhold H. W., 4,551,534, Cl. 546-123.000.

Bendiberica, S.A.: *See—*
Coll, Juan V.; Bacardit, Juan S.; and Bofill, Joaquim F., 4,550,566, Cl. 60-554.000.

Benfey, David P.: *See—*
Miller, Gary; Jobes, Sam S.; and Benfey, David P., 4,551,657, Cl. 315-399.000.

Benquey, Jean; and Benquey, Louisa F., to Societe d'Exploitation du Laboratoire Abadie. Light ramp for lighting instrument panels, more especially in aircraft or helicopter. 4,551,790, Cl. 362-23.000.

Benquey, Louisa F.: *See—*
Benquey, Jean; and Benquey, Louisa F., 4,551,790, Cl. 362-23.000.

Bensadon, Joseph M.; and Brickman, Norman F., to International Business Machines Corporation. X.21 Switching system. 4,551,835, Cl. 370-110.100.

Benzinger, Hans, to Thielscher-Electronic GmbH. Coupling filter, especially an input filter, for receivers of centralized ripple control systems. 4,551,686, Cl. 330-100.000.

Beppu, Masaru; Agawa, Setsuo; Hazeyama, Takeshi; and Nashimoto, Toshiyuki, to Nittetsu Mining Co., Ltd. Apparatus for classifying particulate material with air currents. 4,551,240, Cl. 209-143.000.

Berchem, Rutger, to Berchem & Schaberg GmbH. Traction chain for a driven wheel of a wheeled vehicle. 4,550,757, Cl. 152-228.000.

Berchem & Schaberg GmbH: *See—*
Berchem, Rutger, 4,550,757, Cl. 152-228.000.

Berenguier, Pierre H.: *See—*
ab der Halden, Charles H.; and Berenguier, Pierre H., 4,551,845, Cl. 375-40.000.

Berg, Arthur A., to Sloan Valve Company. Front air swingaway. 4,550,928, Cl. 280-421.000.

Berg, Gunnar H., to Hughes Tool Company. Elevator/spider with counterbalance. 4,550,942, Cl. 294-102.200.

Berg, Lloyd; and Yeh, An-I. Separation of isopropyl ether from acetone by extractive distillation. 4,551,207, Cl. 203-56.000.

Berg, Richard M. Omni-directional radar and electro-optical multiple corner retro reflectors. 4,551,726, Cl. 343-18.00C.

Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Agent for the determination of esterolytic and/or proteolytic enzymes. 4,551,428, Cl. 435-19.000.

Berger, Karl. Throat examination device. 4,550,717, Cl. 128-16.000.

Berkowitz, Herbert: *See—*
Coleman, D. Jackson; Orcutt, Donald E.; and Berkowitz, Herbert, 4,551,129, Cl. 604-21.000.

Bernardi, Adriano: *See—*
Canella, Marco; Marghinotti, Daniele; Bernardi, Adriano; and Sodini, Giancarlo, 4,551,335, Cl. 426-44.000.

Bernhardt, Anthony F., to Spectra-Physics, Inc. Noise reduction in laser amplifiers. 4,551,684, Cl. 330-4.300.

Berrebi, Georges, to Eurecat-Europeene de Retraitement de Catalyseurs. Process for the transportation through an elongate chamber and electromagnetic radiation heating of granulated material. 4,551,437, Cl. 502-5.000.

Berrehail, Mohamed. Orthopedic vest for support and restrainment in the treatment of subjects to trauma and surgery of the shoulder, scapular arch and upper limb. 4,550,724, Cl. 128-133.000.

Bertinger, Roland: *See—*
Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, 4,551,328, Cl. 423-607.000.

Bertsch, Peter K., to Helix Technology Corporation. Balanced integral Stirling cryogenic refrigerator. 4,550,571, Cl. 62-6.000.

Best Lock Corporation: *See—*
Best, Walter E.; and Foshee, William R., 4,550,581, Cl. 70-422.000.

Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Break-away knob driver. 4,550,581, Cl. 70-422.000.

Beta II, Incorporated: *See—*
Volk, Joseph A., Jr.; and Volk, Joseph A., 4,550,619, Cl. 73-862.620.

Betancourt, Humberto: *See—*
Calderon, Jose L.; and Betancourt, Humberto, 4,551,232, Cl. 208-92.000.

Betelle, Jean: *See—*
Jourdan, Jean-Marie; Betelle, Jean; and Bougon, Philippe M. M., 4,551,632, Cl. 307-9.000.

Bethmann, Karl W., to Rheinmetall GmbH. Method of making a hollow-charge inserts for armor-piercing projectiles. 4,551,287, Cl. 269-3.00R.

Betsch, Regis J.; Liu, Michael S.; and Tufte, Obert N., to Honeywell Inc. Integrated three-dimensional localized epitaxial growth of Si with localized overgrowth of GaAs. 4,551,394, Cl. 428-641.000.

Bettle, Griscom, III: *See—*
Barker, Dale E.; Bettle, Griscom, III; and Van Coney, Robert H., 4,550,862, Cl. 222-109.000.

Bey, Philippe, to Merrell Dow Pharmaceuticals Inc. N-2,3-Butadienyl-1,4-butanediamine derivatives. 4,551,550, Cl. 564-215.000.

Beyerle, Rudi: *See—*
Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,551,454, Cl. 514-252.000.

Bhojwani, Arju H.; and Woebcke, Herman N., to Stone & Webster Engineering Corp. Solids quench boiler and process. 4,550,769, Cl. 165-1.000.

Bianchi, Julio J., to General Electric Company. Flip-over mechanism. 4,551,621, Cl. 235-117.00R.

Biber, Conrad H., to Polaroid Corporation. Sonic ranging/detection system employing varied beamwidth. 4,551,825, Cl. 367-101.000.

BICC Public Limited Company: *See—*
Verne, Stefan, 4,551,569, Cl. 585-6.600.

Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, to Bruker Analytische Messtechnik GmbH. Coupling arrangement for a cavity resonator. 4,551,694, Cl. 333-24.00C.

Biernacki, Andreas: *See—*
Denner, Wolf J.; Biernacki, Andreas; and Breitschwerdt, Gunter, 4,550,650, Cl. 98-115.300.

Bilik, Charles W.: *See—*
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,551,070, Cl. 417-68.000.

Billerbeck, Gerd: *See—*
Endel, Dieter; and Billerbeck, Gerd, 4,550,459, Cl. 5-437.000.

Bio Clinic Company: *See—*
Wagner, Bill L., Sr., 4,550,547, Cl. 53-430.000.

Bio-Organics, Inc.: *See—*
Tenzer, Abraham I., 4,551,164, Cl. 71-6.000.

BioResearch Inc.: *See—*
Kurtz, Robert J.; and LiCausi, Joseph, 4,550,722, Cl. 128-80.00A.

Bird, George R.: *See—*
Custer, Peter A.; and Bird, George R., 4,551,827, Cl. 369-101.000.

Bisbee, Gary W.: *See—*
McTamaney, Louis S.; Bisbee, Gary W.; Kettlety, Robert W.; and Konsevich, James L., 4,551,730, Cl. 346-33.0WL.

Bishop, Robert R. Apparatus for orienting and stacking hollow, frustoconical containers. 4,550,820, Cl. 198-389.000.

Bitsch, Harald; Donner, Klaus; Hasselmann, Heinz; and Horbach, Rainer, to Mannesmann Aktiengesellschaft. Track wheel block. 4,550,664, Cl. 105-180.000.

Black & Decker Inc.: *See—*
Moores, Robert G., Jr.; Sides, Daniel H.; and Burnside, Howard L., 4,550,501, Cl. 30-393.000.
Wilson, Peter H., 4,551,615, Cl. 219-373.000.

Blair, John J., to Dentsply Research & Development Corp. Method and apparatus to produce artificial dentures. 4,551,098, Cl. 433-171.000.

Blakeway Marviroll Pools Pty. Ltd.: *See*—
Blakeway, Stanley R., 4,550,538, Cl. 52-169.700.

Blakeway, Stanley R., to Blakeway Marviroll Pools Pty. Ltd. Pool and method of making same. 4,550,538, Cl. 52-169.700.

Blanie, Paul; and Vernier, Claude. Method for obtaining clear plant juices and for the recovery of valorizable constituents. 4,551,341, Cl. 426-489.000.

Blattner, Rudolf, to Ciba Geigy AG. Process for isolating 2-naphthylamine-3,6,8-trisulfonic acid in the form of the monopotassium or monoammonium salt. 4,551,283, Cl. 260-508.000.

Blauwhoff, Petrus M. M.; and Cornelissen, Anton E., to Shell Oil Company. Continuous thermal cracking process. 4,551,233, Cl. 208-106.000.

Bley, Peter: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; Fritz, Wolfgang; Steinhaus, Harald; and Bley, Peter, 4,551,157, Cl. 55-17.000.

Blinne, Gerd; and Muench, Volker, to BASF Aktiengesellschaft. Transparent flame-retardant poly(arylether-arylsulfone) molding materials. 4,551,493, Cl. 524-89.000.

Blossfeld, Lothar, to ITT Industries, Inc. Monolithic integrated circuit. 4,550,490, Cl. 29-571.000.

Bloy, Vincente: *See*—
Frank-Neumann, Michel; Sedrati, Madjid; Vigneron, Jean-Pierre; and Bloy, Vincente, 4,551,545, Cl. 560-124.000.

Board of Regents, The University of Texas System: *See*—
Hanahan, Donald J.; and Pinckard, R. Neal, 4,551,446, Cl. 514-77.000.

Boardman, Peter W., to Deere & Company. Scrap scroller for a shear discharge conveying system. 4,550,881, Cl. 242-56.00R.

Bocker, Albert, to Albert Bocker GmbH & Co. KG. Elevating apparatus. 4,550,806, Cl. 187-10.000.

Boehringer Mannheim GmbH: *See*—
Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, 4,551,428, Cl. 435-19.000.
Draeger, Brigitte; and Ziegenhorn, Joachim, 4,551,427, Cl. 435-14.000.

Bofill, Joaquim F.: *See*—
Coll, Juan V.; Bacardit, Juan S.; and Bofill, Joaquim F., 4,550,566, Cl. 60-554.000.

Bogue, Carl E. Fishing pole holder. 4,550,520, Cl. 43-21.200.

Bohn, Helmut: *See*—
Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,551,454, Cl. 514-252.000.

Bolton, Joseph A.; and Salls, David J., to Albany International Corporation. Vacuum control system and method for dewatering fabrics. 4,551,202, Cl. 162-198.000.

Bonis, Laszlo J., to Composite Container Corporation. Rigid coextruded sheet and container. 4,551,365, Cl. 428-35.000.

Booher, Howard. Movable rear cross bar. 4,550,947, Cl. 296-181.000.

Borchert, Werner; and Nitsch, Klaus D. Device for separating solid particles of dirt from cooling water for power stations. 4,551,247, Cl. 210-304.000.

Borders, Donald B.: *See*—
Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., 4,551,533, Cl. 546-35.000.

Borg-Warner Chemicals, Inc.: *See*—
Halpern, Yuval; and Mott, Donna, 4,551,527, Cl. 544-214.000.
Hechenbleikner, Ingenuin; and Enlow, William P., 4,551,539, Cl. 548-412.000.
Hechenbleikner, Ingenuin; and Enlow, William P., 4,551,540, Cl. 548-531.000.

Borg-Warner Corporation: *See*—
Venema, Harry J., 4,550,595, Cl. 73-116.000.

Borza, John S.: *See*—
Drutchas, Gilbert H.; and Borza, John S., 4,550,597, Cl. 73-118.000.

Bosch, Russell H.: *See*—
Teerman, Richard F.; Bosch, Russell H.; and Wirth, Ricky C., 4,550,875, Cl. 239-88.000.

Boss, Heinz, to Grapha - Holding AG. Apparatus for storing or dispensing paper sheets or the like. 4,550,883, Cl. 242-59.000.

Bossaert, Jean, to Thomson-CSF. Method of tomographic scanning of an object by nuclear magnetic resonance. 4,551,679, Cl. 324-309.000.

Bossert, Friedrich: *See*—
Wehinger, Egbert; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,551,467, Cl. 514-334.000.

Bossler, Joseph. Countersink core drill assembly and method of utilizing same. 4,551,045, Cl. 408-206.000.

Botrel, Jose ; Harari, Sami; Briere, Joseph; and Louvel, Bernard, to L'Etat Francais represente par le Ministre des PTT (Centre National d'Etudes des Telecommunications); and Telediffusion de France. Error-protecting system for a two-way asynchronous data transmission. 4,551,839, Cl. 371-35.000.

Bott, Kaspar; Kaibel, Gerd; Hartmann, Horst; Irnich, Rudolf; and Buelow, Horst, to BASF Aktiengesellschaft. Recovery of formic acid by distillation. 4,551,208, Cl. 203-60.000.

Bottcaer, Hugo; Heimrich, Klaus; Hildebrandt, Gustav; Kracke, Heinrich; and Richter, Johannes, to J. H. Benecke GmbH. Method of making an embossing cylinder. 4,551,297, Cl. 264-224.000.

Boudreaux, Ronald J. Duplex pump controller. 4,551,068, Cl. 417-8.000.

Bouffard, Jean; Dumoulin, Andre ; and Lederhose, Edgar K., to Northern Telecom Limited. Cradle for a twisting machine. 4,550,558, Cl. 57-58.520.

Bougeois, Jean-Luc: *See*—
Ratton, Serge; and Bougeois, Jean-Luc, 4,551,557, Cl. 568-433.000.
Ratton, Serge; and Bougeois, Jean-Luc, 4,551,558, Cl. 568-433.000.

Bougon, Philippe M. M.: *See*—
Jourdan, Jean-Marie; Betelle, Jean; and Bougon, Philippe M. M., 4,551,632, Cl. 307-9.000.

Bourauel, Fritz; and Weishaupt, Walter, to Bayerische Motoren Werke AG. Service interval signalling device for prime movers. 4,551,703, Cl. 340-52.00D.

Bouwman, Dale W.; and Clayborn, Harold K., to Miles Laboratories, Inc. Sealed reagent matrix. 4,551,306, Cl. 422-56.000.

Bowen, David R.: *See*—
Lewis, John D.; Keeling, Michael R.; Bowen, David R.; and Paton, Anthony D., 4,551,731, Cl. 346-75.000.

Bowling, Teamus. Variable power control device. 4,551,589, Cl. 200-38.00A.

Boyadjiev, Lyubomir A., to Edinen Centar Po Chimia. Method of and apparatus for mass transfer between three liquid phases. 4,551,252, Cl. 210-638.000.

Bracha, Peretz; and Massil, Solomon, to Makhteshim Chemical Works, Ltd. Quinazolines and fungicidal compositions thereof. 4,551,458, Cl. 514-259.000.

Braid, Milton, deceased (by Frangatos, Gerassimos, executor), to Mobil Oil Corporation. Phenolic antioxidants and lubricants containing same. 4,551,259, Cl. 252-48.200.

Brancheau, Harry A.: *See*—
Nussdorfer, William R.; Brancheau, Harry A.; and Clark, Steven C., 4,550,770, Cl. 165-29.000.

Branson Ultrasonics Corporation: *See*—
Quist, Eric, 4,551,690, Cl. 331-36.00L.

Brassat, Bert; Buysch, Hans-Josef; Hermann, Karl H.; and Haupt, Heinrich, to Bayer Aktiengesellschaft. Weather-resistant polyamides. 4,551,495, Cl. 524-94.000.

Breedyk, Frans N.; and van Gelderen, Guido, to Goodyear Tire & Rubber Company, The. Apparatus and method adapted to test tires by eliminating jitter from data signals without losing data. 4,550,598, Cl. 73-146.000.

Breitschwerdt, Gunter: *See*—
Denner, Wolf J.; Biernacki, Andreas; and Breitschwerdt, Gunter, 4,550,650, Cl. 98-115.300.

Bren, Viktor G.: *See*—
Axenov, Ivan I.; Bren, Viktor G.; Padalka, Valentin G.; Sablev, Leonid P.; Stupak, Rimma I.; and Khoroshikh, Vladimir M., 4,551,221, Cl. 204-298.000.

Breslow, Jeffrey D.: *See*—
Ferris, Michael J.; and Breslow, Jeffrey D., 4,550,917, Cl. 273-246.000.

Brickman, Norman F.: *See*—
Bensadon, Joseph M.; and Brickman, Norman F., 4,551,835, Cl. 370-110.100.

Bridge, Michael L., to Dresser Industries, Inc. Apparatus for restraining electronic assemblies. 4,550,599, Cl. 73-151.000.

Brieger, Hans: *See*—
Bruderer, Werner; Brieger, Hans; and Hurlemann, Ernst, 4,550,641, Cl. 89-12.000.

Briere, Joseph: *See*—
Botrel, Jose ; Harari, Sami; Briere, Joseph; and Louvel, Bernard, 4,551,839, Cl. 371-35.000.

Brinkwerth, Wolfgang; Huffer, Wolfgang; Raue, Roderich; Schieder, Rudolf; and Telle, Helmut, to Bayer Aktiengesellschaft. Fluorescent dyestuffs, processes for their preparation and their use as laser dyestuffs. 4,551,265, Cl. 252-301.170.

Brittain, Robert D.: *See*—
Wood, Bernard J.; Brittain, Robert D.; and Sancier, Kenneth M., 4,551,155, Cl. 48-197.00R.

Broucksou, Robert H.: *See*—
Martin, George; and Broucksou, Robert H., 4,550,625, Cl. 74-335.000.

Broughton, Roger; and da Costa, Bernardo, to Canadian Patents & Development Limited. Movement artifact detector for sleep analysis. 4,550,736, Cl. 128-731.000.

Brouwer, Cornelis, to Rotaque (Proprietary) Limited. Bottom discharge hopper structures. 4,550,665, Cl. 105-241.200.

Brouwer, Frans. Servo-motor assembly for machine slides. 4,550,626, Cl. 74-409.000.

Brown, Gerald W., to Kollmorgen Technologies Corporation. Double coil constant force extension spring bracket. 4,551,646, Cl. 310-242.000.

Brown, Ivan H.: *See*—
Bykerk, Rocky S., 4,551,781, Cl. 361-143.000.

Brown, Vernon E., Jr.: *See*—
Ames, Theodore; and Brown, Vernon E., Jr., 4,551,025, Cl. 366-144.000.

Brown & Williamson Tobacco Corporation: *See*—
Riehl, Tilford F., Jr., 4,550,740, Cl. 131-336.000.

Browning, Arthur J. Molded wheeled luggage, ensemble thereof and process for making the same. 4,550,813, Cl. 190-18.00A.

Bruderer, Werner; Brieger, Hans; and Hurlemann, Ernst, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Safety apparatus in externally powered firing weapon. 4,550,641, Cl. 89-12.000.

Bruker Analytische Messtechnik GmbH: *See*—
Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, 4,551,694, Cl. 333-24.00C.

Brummel, Arthur D.: *See*—
Fehrenkamp, William; Pater, Arnold R.; and Brummel, Arthur D., 4,551,824, Cl. 367-76.000.

Bruno, John J.: *See—*
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,551,459, Cl. 514-267.000.
Brunswick Corporation: *See—*
Johnson, Richard H.; and Muma, George A., 4,550,467, Cl. 15-228.000.
Brush Wellman Inc.: *See—*
Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., 4,551,187, Cl. 148-411.000.
Brust, David P.; Neumann, Stephen M.; and Weissberger, Edward, to Eastman Kodak Company. Sequestrants used in diffusion transfer elements with metallizable dyes. 4,551,411, Cl. 430-216.000.
BSL Corporation. *See—*
Gidge, Kenneth N.; and Richard, Henry J., 4,550,760, Cl. 160-328.000.
Buck, Alfred: *See—*
Kuhn, Falk; and Buck, Alfred, 4,550,577, Cl. 66-104.000.
Buck, Robert; and Lamarche, Jean L., to IFM Electronic GmbH. Electronic monitoring system with direct-current power supply. 4,551,637, Cl. 307-308.000.
Buckley, Galen L.; and Fox, Paul L., to Pyramid Optical, Inc. Method of constructing a beam spread lens. 4,550,482, Cl. 29-412.000.
Budd Company, The: *See—*
Epel, Joseph N.; and Wilkinson, Robert E., 4,551,085, Cl. 425-405.00R.
Buel, G. Theodore. Ski boot heel binding. 4,550,929, Cl. 280-614.000.
Buelow, Horst: *See—*
Bott, Kaspar; Kaibel, Gerd; Hartmann, Horst; Irnich, Rudolf; and Buelow, Horst, 4,551,208, Cl. 203-60.000.
Bummer, Bruce L. Climbing assist apparatus having controlled descent and escape mechanism. 4,550,804, Cl. 182-233.000.
Burberry, Lee M.: *See—*
Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., 4,551,829, Cl. 370-3.000.
Burczynski, Thomas J. Expanding projectiles. 4,550,662, Cl. 102-509.000.
Burger, Jurgen: *See—*
Kasparek, Alois; and Burger, Jurgen, 4,551,040, Cl. 406-28.000.
Burke, William L., Sr.; Marple, Elwood; and Suisman, A. Eileen. Liquid level marker for container. 4,550,602, Cl. 73-428.000.
Burnside, Howard L.: *See—*
Moores, Robert G., Jr.; Sides, Daniel H.; and Burnside, Howard L., 4,550,501, Cl. 30-393.000.
Burroughs Corporation: *See—*
Graham, John F., 4,550,885, Cl. 242-204.000.
Horvath, Carlos F., 4,551,798, Cl. 364-200.000.
Spisz, Albert S., 4,551,118, Cl. 464-182.000.
Burroughs Wellcome Co.: *See—*
Bair, Kenneth W., 4,551,282, Cl. 260-501.180.
Stratford, Michael G.; and Spencer-Watkins, Harry C., 4,550,745, Cl. 137-99.500.
Burzynski, Alfred J.; and Tillman, James J., to Owens-Illinois, Inc. Tintable scratch resistant coating. 4,551,361, Cl. 427-164.000.
Butler, Donald E., to Warner-Lambert Company. Hexahydro-3,5-dioxo-1H-pyrrolizine-2-carboxylic acid and derivatives, and use for reversing electroconvulsive shock amnesia. 4,551,470, Cl. 514-413.000.
Butterworth Inc.: *See—*
Pacht, Amos, 4,551,077, Cl. 417-454.000.
Buttery, Michael H. C., to Thorn Emi Domestic Appliances Limited. Heating apparatus. 4,551,616, Cl. 219-460.000.
Buttinoni, Ada: *See—*
Doria, Gianfederico; Passarotti, Carlo; Arcari, Giuliana; and Buttinoni, Ada, 4,551,457, Cl. 514-258.000.
Buttner, Gerhard: *See—*
Leikert, Klaus; Buttner, Gerhard; and Michelfelder, Sigfrid, 4,551,090, Cl. 431-188.000.
Buysch, Hans-Josef: *See—*
Brassat, Bert; Buysch, Hans-Josef; Hermann, Karl H.; and Haupt, Heinrich, 4,551,495, Cl. 524-94.000.
Bykerk, Rocky S., to Nicholson, Chris G.; Parrish, J. Gid; Brown, Ivan H.; and Gordon, Reuben H. Control circuit for magnetic probe. 4,551,781, Cl. 361-143.000.
Byrne, Norman R. Retractable power center. 4,551,577, Cl. 174-57.000.
Byron, David A.: *See—*
Gorman, William G.; and Byron, David A., 4,551,135, Cl. 604-82.000.
C. R. Bard, Inc.: *See—*
Krikorian, Donald J., 4,550,749, Cl. 137-843.000.
Cable Belt Limited: *See—*
Thomson, Ian M., 4,550,559, Cl. 57-223.000.
Calderon, Jose L.; and Betancourt, Humberto, to Intevep, S.A. Process and facility for making coke suitable for metallurgical purposes. 4,551,232, Cl. 208-92.000.
Caldwell, W. Kenneth. Hand held digital measuring device. 4,551,847, Cl. 377-24.000.
Callaghan, Stephen P.; Callaghan, Timothy J.; Gustafson, Harry A.; and Lim, Wah L., to Honeywell Inc. Discriminant apparatus for laser gyros. 4,551,021, Cl. 356-350.000.
Callaghan, Timothy J.: *See—*
Callaghan, Stephen P.; Callaghan, Timothy J.; Gustafson, Harry A.; and Lim, Wah L., 4,551,021, Cl. 356-350.000.
Callahan, David J.; Mazzawy, Robert S.; Stryker, Howard Y.; and Kelly, James B., to United Technologies Corporation. Engine surge prevention system. 4,550,564, Cl. 60-39.093.
Cambridge Consultants Limited: *See—*
Lewis, John D.; Keeling, Michael R.; Bowen, David R.; and Paton, Anthony D., 4,551,731, Cl. 346-75.000.
Cambridge, Edward L.: *See—*
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and Rogers, Charles J., 4,551,218, Cl. 204-240.000.
Campbell, James R., to Mahoney, Thomas P.; Ruston, Donald A.; and Barnes, Robert S., a part interest to each. Method and apparatus for fabricating honeycomb seal. 4,551,604, Cl. 219-78.120.
Campbell, Marshall S.: *See—*
McMullen, Carl R.; and Campbell, Marshall S., 4,550,768, Cl. 164-456.000.
Campbell, Roy: *See—*
Price, Anthony G.; and Campbell, Roy, 4,550,810, Cl. 188-71.400.
Campen, Kenneth W., to Tecumseh Products Company. Flywheel mounting of permanent magnet group. 4,550,697, Cl. 123-149.00D.
Canadian Patents & Development Limited: *See—*
Broughton, Roger; and da Costa, Bernardo, 4,550,736, Cl. 128-731.000.
Canalizo, Carlos R. Well pump. 4,551,075, Cl. 417-383.000.
Canay, Muzaffer, to BBC Brown, Boveri & Company, Limited. Apparatus for reducing subsynchronous frequencies in a power supply. 4,551,780, Cl. 361-113.000.
Canella, Marco; Marghinotti, Daniele; Bernardi, Adriano; and Sodini, Giancarlo, to E.N.I. Ente Nazionale Incorporated. Fermented sunflower meal and the method for its preparation. 4,551,335, Cl. 426-44.000.
Canning, John L.; and Kay, John F., to Owens-Corning Fiberglas Corporation. Method of molding multi-ply polymeric composites. 4,551,390, Cl. 428-431.000.
Cano, Manuel I., to Ensamblaje y Manipulacion Industrial, S.A. (EMINSA). Apparatus for applying reinforcement bottoms to plastic bottles. 4,551,193, Cl. 156-423.000.
Canon Kabushiki Kaisha: *See—*
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, 4,551,404, Cl. 430-59.000.
Ito, Michio; Kitajima, Nobuo; Kasai, Masanao; and Ishihara, Shunichi, 4,551,003, Cl. 355-3.00R.
Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, 4,551,000, Cl. 355-3.00R.
Masunaga, Makoto; and Kinoshita, Takao, 4,551,758, Cl. 358-213.000.
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,551,405, Cl. 430-64.000.
Ohtsuka, Masanori; and Tokuda, Ryuji, 4,550,992, Cl. 354-173.110.
Sado, Ichiro; Kishimoto, Juji; Sasaki, Masayuki; and Cho, Mitsuo, 4,551,818, Cl. 364-900.000.
Suzuki, Eiichi, 4,551,736, Cl. 346-140.00R.
Suzuki, Tetsuo; and Tazaki, Shigemitsu, 4,551,735, Cl. 346-140.00R.
Toyama, Masamichi, 4,550,995, Cl. 354-403.000.
Cantrel, James F.: *See—*
Hughes, Robert W.; and Cantrel, James F., 4,551,050, Cl. 411-436.000.
Capper, Peter; and Gosney, John J., to U.S. Philips Corporation. Method of growing crystalline cadmium mercury telluride and crystalline cadmium mercury telluride grown by the method. 4,551,196, Cl. 156-616.00R.
Caramaschi, Vittorio; and Castelli, Pier Luigi, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Helicopter rotor. 4,551,067, Cl. 416-140.000.
Carey, Patrick H., Jr., to Minnesota Mining and Manufacturing Company. Nonwoven thermal insulating stretch fabric and method for producing same. 4,551,378, Cl. 428-198.000.
Carl Freudenberg, Firma: *See—*
Tamura, Tadashi; Nakao, Etsuro; and Yamazaki, Hiroaki, 4,551,402, Cl. 429-254.000.
Carl-Zeiss-Stiftung: *See—*
Meier, Hans-Jurgen, 4,550,979, Cl. 350-321.000.
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., to Cypher Systems. Oil field lease management and security system and method therefor. 4,551,719, Cl. 340-825.360.
Carlin, Samuel R.: *See—*
Karliner, Rudolf R.; and Carlin, Samuel R., 4,551,036, Cl. 401-131.000.
Carll, Richard T.; Fastaia, Anthony J.; and von Nieda, Kurt, to United Technologies Corporation. Telephone based control system. 4,551,832, Cl. 370-58.000.
Carlson, Richard P.: *See—*
Wei, Peter H. L.; and Carlson, Richard P., 4,551,538, Cl. 548-367.000.
Carmichael, Jerry H.; and Wellington, Charles H., to Dresser Industries, Inc. Method and apparatus for acoustic cement bond logging. 4,551,823, Cl. 367-35.000.
Carnes, Ronald C.; and Naumann, Ted F., Jr., to General Electric Company. Oscillating scanner and drive mechanism therefor. 4,550,608, Cl. 73-633.000.
Caro, Edward R.: *See—*
Goldstein, Richard M.; Caro, Edward R.; and Wu, Chialin, 4,551,724, Cl. 343-5.0CM.
Carpenter, Francis W., III: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,550,657, Cl. 100-43.000.

Carricato, Louis: *See—*
El-Hag, Nabil A.; Cochran, Stuart A.; Schwabe, Kenneth R.; Carricato, Louis; and Shanbhag, Sudhakar P., 4,551,340, Cl. 426-437.000.
Carson, Don B., to UOP Inc. Utility conservation in hydrogen recycle conversion processes. 4,551,235, Cl. 208-100.000.
Carson, Donald W.; Penrose, Lee; Leich, Joseph E.; and Caugherty, William C., to Carson Medical Incorporated. Slosh dampening waste receptacle for chairs for care of incontinent persons. 4,550,455, Cl. 4-480.000.
Carson, John C.; and Clark, Stewart A., to Irvine Sensors Corporation. Detector array module-structure and fabrication. 4,551,629, Cl. 250-578.000.
Carson Medical Incorporated: *See—*
Carson, Donald W.; Penrose, Lee; Leich, Joseph E.; and Caugherty, William C., 4,550,455, Cl. 4-480.000.
Carter-Wallace Inc.: *See—*
Sisbarro, Frederick P., 4,551,093, Cl. 432-59.000.
Cash, Gordon G., to Olin Corporation. Paper sizing composition and method. 4,551,200, Cl. 162-135.000.
Cash, Gordon G., to Olin Corporation. Paper sizing composition and method. 4,551,201, Cl. 162-158.000.
Caslin, Richard L.: *See—*
Gaither, John L., 4,550,553, Cl. 56-202.000.
Cassella Aktiengesellschaft: *See—*
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.
Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,551,454, Cl. 514-252.000.
Castelli, Pier Luigi: *See—*
Caramaschi, Vittorio; and Castelli, Pier Luigi, 4,551,067, Cl. 416-140.000.
Castner, John F., Jr.: *See—*
Castner. Sr., J. Fred; and Castner, John F., Jr., 4,550,857, Cl. 221-70.000.
Castner. Sr., J. Fred; and Castner, John F., Jr. Cotton swab vender. 4,550,857, Cl. 221-70.000.
Caterpillar Tractor Co.: *See—*
Demeny, Gary L.; and Smead, Robert G., 4,550,678, Cl. 118-630.000.
Caugherty, William C.: *See—*
Carson, Donald W.; Penrose, Lee; Leich, Joseph E.; and Caugherty, William C., 4,550,455, Cl. 4-480.000.
Causley, Gary C.; and Rosback, Martin D., to Tektronix, Inc. Ink cartridge with ink level sensor. 4,551,734, Cl. 346-140.00R.
Cavazza, Claudio; and Tinti, Maria O., to Sigma-Tau Industrie Farmaceutiche Riunite S.P.A. Esters of alkoxy-acylderivatives of carnitine and pharmaceutical compositions containing same. 4,551,477, Cl. 514-547.000.
CdF Chimie Azote et Fertilisants, S.A.: *See—*
Sanchez, Pierre; and Laudat, Pierre, 4,551,319, Cl. 423-316.000.
Central Electricity Generating Board: *See—*
Cox, Anthony F.; Glanville, Roger; Lloyd, Owen; and Robbins, Keith V., 4,550,591, Cl. 73-28.000.
Central Glass Company Limited: *See—*
Hayakawa, Masanori; Yamada, Noriaki; Kawamoto, Hiromi; and Nishimura, Satoshi, 4,551,260, Cl. 252-62.590.
Cerberus AG: *See—*
Troup, Alan P.; Guttinger, Hannes; and Pfister, Gustav, 4,551,710, Cl. 340-505.000.
CertainTeed Corporation: *See—*
Scott, Peter T., 4,550,550, Cl. 53-529.000.
Sullivan, Dale W.; Janssen, Kermit W.; and Mitchell, Andrew, 4,550,778, Cl. 166-234.000.
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips with interlocking latch means. 4,550,729, Cl. 128-325.000.
Ceserani, Roberto: *See—*
Faustini, Franco; Passarotti, Carlo; Ceserani, Roberto; and Gandolfi, Carmelo, 4,551,476, Cl. 514-461.000.
Chambers, Charles A.: *See—*
Garrett, Ernest R.; and Chambers, Charles A., 4,550,851, Cl. 220-277.000.
Champlin, George B., to Seal Company of New England, The. Shaped mechanical compression packing. 4,550,639, Cl. 87-7.000.
Chan, Lo K.; Tang, Yui K.; and Chang, Jui, to ASM Assembly Automation Ltd. Four-motion wire bonder. 4,550,871, Cl. 228-4.500.
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., to AT&T Bell Laboratories. Process for preparing semiconductors using photosensitive bodies. 4,551,416, Cl. 430-311.000.
Chang, Jui: *See—*
Chan, Lo K.; Tang, Yui K.; and Chang, Jui, 4,550,871, Cl. 228-4.500.
Chang, Shung-Ho: *See—*
Freytag, William J.; and Chang, Shung-Ho, 4,551,426, Cl. 435-7.000.
Chapman, Paul: *See—*
Aston, Geoffrey W.; Smith, Susan; Chapman, Paul; and Barker, Howard A., 4,551,384, Cl. 428-312.600.
Chappell, Barbara A.; Chappell, Terry I.; and Woodall, Jerry M., to International Business Machines Corporation. Heterojunction semiconductor. 4,550,489, Cl. 29-571.000.
Chappell, Terry I.: *See—*
Chappell, Barbara A.; Chappell, Terry I.; and Woodall, Jerry M., 4,550,489, Cl. 29-571.000.
Charpentier, Albert J.; Redfield, James W.; and DiOrio, David W., to Commodore Business Machines, Inc. Digital sine-cosine generator. 4,551,682, Cl. 328-22.000.
Chemical Research & Licensing Company: *See—*
Smith, Lawrence A., Jr., 4,551,567, Cl. 568-907.000.
Chemische Werke Huels, AG: *See—*
Otte, Werner; Nehring, Rudolf; and zur Hausen, Manfred, 4,551,564, Cl. 568-834.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Draexler, Adolf, 4,551,392, Cl. 428-495.000.
Chen, Jiang-Tsun: *See—*
Asmussen, Frithjof; Sotobayashi, Hideto; Chen, Jiang-Tsun; and Schnabel, Wolfram, 4,551,414, Cl. 430-270.000.
Chen, Ying-Cheng. Infusion bag. 4,551,336, Cl. 426-83.000.
Chevron Research Company: *See—*
Baugher, Stuart W., 4,550,690, Cl. 122-510.000.
Ferm, Richard L., 4,551,226, Cl. 208-48.0AA.
Marcantonio, Paul J., 4,551,315, Cl. 423-67.000.
Miller, Stephen J., 4,551,438, Cl. 502-62.000.
Pecoraro, Theresa A.; Krug, Russell R.; and Deady, Joanne, 4,551,229, Cl. 208-76.000.
Chewey, Paul M.: *See—*
Douglass, Randle; Jacquin, H. George; Chewey, Paul M.; Galvan, Paul A.; and Naragon, Richard S., 4,550,888, Cl. 244-3.220.
Chiba, Norio: *See—*
Nagatani, Toshio; Chiba, Norio; Hatanaka, Takao; and Saito, Toshio, 4,551,367, Cl. 428-35.000.
Chicopee: *See—*
Elves, John; and Ley, Stephen J., 4,551,377, Cl. 428-137.000.
Chida, Tsuneaki: *See—*
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.
Chinon Kabushiki Kaisha: *See—*
Maruyama, Takashi, 4,550,994, Cl. 354-402.000.
Chisso Corporation: *See—*
Harada, Masato; Miya, Shinya; Yamada, Sadahiko; and Iijima, Makoto, 4,551,439, Cl. 502-107.000.
Chloride, Inc.: *See—*
Wilson, Frank, 4,551,401, Cl. 429-122.000.
Cho, Mitsuo: *See—*
Sado, Ichiro; Kishimoto, Juji; Sasaki, Masayuki; and Cho, Mitsuo, 4,551,818, Cl. 364-900.000.
Choi, Charles: *See—*
Moutrie, Michael F.; Sokola, Raymond L.; and Choi, Charles, 4,551,696, Cl. 333-204.000.
Chrisley, Barney D. Apparatus for collecting litter and objects from a ground surface. 4,550,465, Cl. 15-84.000.
Chrysler Corporation: *See—*
Lansinger, Jere R.; Dorr, George D.; and Farago, Paul L., 4,550,675, Cl. 116-28.100.
Chung, Chi H., to Minnesota Mining and Manufacturing Company. Quadrilayer optical draw medium. 4,551,828, Cl. 369-275.000.
Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., to Brush Wellman Inc. Copper alloy. 4,551,187, Cl. 148-411.000.
Ciba Geigy AG: *See—*
Blattner, Rudolf, 4,551,283, Cl. 260-508.000.
Ciba-Geigy Corporation: *See—*
Eckert, Theodor, 4,551,475, Cl. 514-408.000.
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,551,531, Cl. 544-320.000.
Traxler, Peter, 4,551,450, Cl. 514-183.000.
Clapp, Thomas R. Mixing apparatus for cementitious materials. 4,551,024, Cl. 366-40.000.
Clark, Richard L.: *See—*
Farrow, Robert I.; and Clark, Richard L., 4,551,190, Cl. 156-159.000.
Clark, Steven C.: *See—*
Nussdorfer, William R.; Brancheau, Harry A.; and Clark, Steven C., 4,550,770, Cl. 165-29.000.
Clark, Stewart A.: *See—*
Carson, John C.; and Clark, Stewart A., 4,551,629, Cl. 250-578.000.
Clark, Thomas R.; and Griffith, Carl D., to Sperry Corporation. Approach to hover control system for helicopters. 4,551,804, Cl. 364-434.000.
Clayborn, Harold K.: *See—*
Bouwman, Dale W.; and Clayborn, Harold K., 4,551,306, Cl. 422-56.000.
Clifford, G. Frank. Apparatus for the dyeing of shaped articles. 4,550,579, Cl. 68-5.00C.
Clouser, Michael T.; and Coulter, Robert S., to Emhart Industries, Inc. Means controlling a flue damper. 4,550,874, Cl. 236-1.00G.
Cobb, Raymond L., to Phillips Petroleum Company. Alkylation of aromatic compounds. 4,551,573, Cl. 585-459.000.
Coble, Stephen J.: *See—*
Zegers de Beyl, Rene H.; and Coble, Stephen J., 4,551,133, Cl. 604-66.000.
Coca-Cola Company, The: *See—*
Credle, William S., Jr., 4,550,624, Cl. 74-110.000.

Cochran, Stuart A.: *See*—
El-Hag, Nabil A.; Cochran, Stuart A.; Schwabe, Kenneth R.; Carricato, Louis; and Shanbhag, Sudhakar P., 4,551,340, Cl. 426-437.000.

Codman & Shurtleff, Inc.: *See*—
Santangelo, John A.; and DiGiantommaso, Michael, 4,550,715, Cl. 128-4.000.

Coffinberry, George A., to United States of America, National Aeronautics and Space Administration. Method for improving the fuel efficiency of a gas turbine engine. 4,550,561, Cl. 60-39.020.

Coffing, Samuel F., to International Resources Management, Inc. Flotation apparatus utilizing a novel floc barrier and current diverting means. 4,551,246, Cl. 210-221.200.

Cohen, Abraham B.; and Webers, Vincent J., to Du Pont de Nemours, E. I., and Company. Photosensitive coatings containing crosslinked beads. 4,551,415, Cl. 430-281.000.

Cohen, Lenard; and Gordon, Michael E., to Plastic Systems, Inc. Heel grounding strap. 4,551,783, Cl. 361-223.000.

Cohn, Martin; Jacoby, George V.; and Vinding, Jorgen P., to Sperry Corporation. Encoding and decoding apparatus and method utilizing hierarchical code substitution. 4,551,773, Cl. 360-40.000.

Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, to Metropolitan Wire Corporation. Surgical case cart. 4,550,956, Cl. 312-250.000.

Cohrs, Karl S.: *See*—
Pan, Ali; and Cohrs, Karl S., 4,551,087, Cl. 425-466.000.

Coleman, D. Jackson; Orcutt, Donald E.; and Berkowitz, Herbert. Technique and apparatus for intraocular and microsurgery including lighter-irrigator hypodermic tube. 4,551,129, Cl. 604-21.000.

Coll, Juan V.; Bacardit, Juan S.; and Bofill, Joaquim F., to Bendiberica, S.A. Brake master cylinder. 4,550,566, Cl. 60-554.000.

Columbia Gas System Service Corporation: *See*—
Malcosky, Norman D.; and Koziar, Greg, 4,551,154, Cl. 48-193.000.

Columbia University, The Trustees of: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,551,445, Cl. 514-9.000.

Combustion Engineering, Inc.: *See*—
Singh, Gurdip, 4,551,796, Cl. 364-148.000.

Commissariat a l'Energie Atomique: *See*—
Feutrel, Claude, 4,551,300, Cl. 376-364.000.
Zuber, Thierry; and Traiteur, Rene , 4,550,688, Cl. 122-360.000.

Commodore Business Machines, Inc.: *See*—
Charpentier, Albert J.; Redfield, James W.; and DiOrio, David W., 4,551,682, Cl. 328-22.000.

Compagnie des Montres Longines Francillon S.A.: *See*—
Schaffer, Rudolf, 4,551,725, Cl. 343-6.5SS.

Compen, Johannes M. A. A.; and Maan, Cornelis, to U.S. Philips Corporation. Display screen having aluminum phosphate barrier layer and method of manufacture. 4,551,652, Cl. 313-466.000.

Composite Container Corporation: *See*—
Bonis, Laszlo J., 4,551,365, Cl. 428-35.000.

Computer Gesellschaft Konstanz mbH: *See*—
Kochert, Wilfried, 4,551,851, Cl. 382-38.000.

Comtech Telecommunications Corp.: *See*—
Scala, John; and Reuter, William, 4,551,689, Cl. 331-2.000.

Conard, Bruce R.: *See*—
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., 4,551,184, Cl. 148-127.000.

Conlon, Thomas J. Label construction. 4,551,373, Cl. 428-43.000.

Conoco Inc.: *See*—
Coon, Julian B.; and Petry, Eston F., 4,551,041, Cl. 406-85.000.

Consolidated Foods Corporation: *See*—
Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., 4,550,670, Cl. 112-121.110.

Consolidated Technologies Corporation: *See*—
Hibbard, George A.; and Morrison, Ward D., 4,550,785, Cl. 173-134.000.

Construction Technology, Inc.: *See*—
Levine, Richard W., 4,551,810, Cl. 364-475.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Hoheisel, Peter; and Bartholmei, Peter, 4,550,833, Cl. 206-527.000.

Control Fluidics, Inc.: *See*—
Tufts, Wesley M., 4,550,452, Cl. 4-319.000.

Cook Incorporated: *See*—
Osborne, Thomas A., 4,551,137, Cl. 604-171.000.

Cook, John R.; and James, William A., to Johnson & Johnson Baby Products Company. Nonwoven fibrous product and method of making same. 4,551,143, Cl. 604-371.000.

Cooke, Robert A.: *See*—
Dennis, Kenrick J.; and Cooke, Robert A., 4,550,461, Cl. 12-1.00R.

Cookson, John A.; Schatzka, Richard L.; Echard, Richard A.; and Scheer, Gary W., to Tetragenics, Inc. Method and apparatus for transmitting status information between remote locations. 4,551,718, Cl. 340-825.160.

Coon, Dennis R.: *See*—
Heys, George; and Coon, Dennis R., 4,551,675, Cl. 324-158.00F.

Coon, Julian B.; and Petry, Eston F., to Conoco Inc. Vibration method for unplugging a slurry pipeline. 4,551,041, Cl. 406-85.000.

Cooper, David G.; and Sach, George S., to Smith Kline & French Laboratories Limited. Pyridyl-2-oxy-propyl-1H-1,2,4-triazole-3,5-diamines. 4,551,466, Cl. 514-318.000.

Cooper, James M.: *See*—
Ballmann, Fred A.; and Cooper, James M., 4,550,856, Cl. 221-63.000.

Cooper, Stephen M.; and Sooudi, Saeed K., to Siecor Corporation. Fiber optic cable with foamed plastic dummy members. 4,550,976, Cl. 350-96.230.

Cope, Robert: *See*—
Permut, Ronald; Cope, Robert; Apple, James; Epina, August P.; and Munro, Frederick G., 4,550,884, Cl. 242-189.000.

Copeland Corporation: *See*—
Gilmore, Mark R., 4,551,069, Cl. 417-13.000.

Copyer Kabushiki Kaisha: *See*—
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, 4,551,404, Cl. 430-59.000.

Cordis Corporation: *See*—
Batina, William P.; and White, Robert M., 4,550,731, Cl. 128-419.0PT.
Batty, John R., Jr.; and Slocum, Chester D., 4,550,732, Cl. 128-419.0PG.

Cornelissen, Anton E.: *See*—
Blauwhoff, Petrus M. M.; and Cornelissen, Anton E., 4,551,233, Cl. 208-106.000.

Cornell Research Foundation, Inc.: *See*—
Drost, Cornelis J., 4,550,606, Cl. 73-626.000.

Cornet, Jean; Lange , Francois; Le Carvennec, Francois; Lehureau, Jean-Claude; and Rascle, Roger, to Thomson CSF. Protected optical disc comprising a flexible closure element. 4,551,733, Cl. 346-137.000.

Cornils, Boy: *See*—
Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, 4,551,328, Cl. 423-607.000.

Corning Glass Works: *See*—
Gardner, Robert W.; Guile, Donald L.; and Lynn, Merrill, 4,551,295, Cl. 264-177.00R.

Corrigan, John J., to Anton/Bauer, Inc. Battery pack connection. 4,550,968, Cl. 339-91.00R.

Cosden Technology, Inc.: *See*—
Morris, Jeffrey D.; and Fuller, Robert A., 4,551,309, Cl. 422-135.000.
Morris, Jeffrey D.; and Fuller, Robert A., 4,551,510, Cl. 526-68.000.

Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See*—
Caramaschi, Vittorio; and Castelli, Pier Luigi, 4,551,067, Cl. 416-140.000.

Coulin, Jean-Paul, to Societe d'Etudes de Machines Thermiques (SEMT). Piston pin and piston, notably for an internal combustion engine, equipped with said pin. 4,550,647, Cl. 92-157.000.

Coulter, Robert S.: *See*—
Clouser, Michael T.; and Coulter, Robert S., 4,550,874, Cl. 236-1.00G.

Cox, Abraham J.: *See*—
McConnell, Richard L.; Cox, Abraham J.; and Darnell, William R., 4,551,521, Cl. 528-302.000.

Cox, Anthony F.; Glanville, Roger; Lloyd, Owen; and Robbins, Keith V., to Central Electricity Generating Board. Apparatus for monitoring particulate matter. 4,550,591, Cl. 73-28.000.

Cox, John N.: *See*—
Spangler, Glenn E.; and Cox, John N., 4,551,624, Cl. 250-287.000.

Cox, Richard V.; and Jayant, Nuggehally S., to AT&T Bell Laboratories. Time-frequency scrambler. 4,551,580, Cl. 179-1.50S.

CPG Products Corp.: *See*—
Selvage, Craig C.; and Ventura, Frank D., 4,551,110, Cl. 446-118.000.

Crabtree, Daniel L., to United States of America, Navy. Sample video amplifier. 4,551,759, Cl. 358-213.000.

Craiglow, Robert L., to Rockwell International Corporation. Delay compensated automatic gain control. 4,551,688, Cl. 330-280.000.

Cranfield, Brain A.; Fothergill, John C.; and Wolfe, Susan V., to International Standard Electric Corporation. Polymeric dielectrics. 4,551,499, Cl. 524-487.000.

Cranfill, Leonard J.: *See*—
Smith, Dwight D.; and Cranfill, Leonard J., 4,550,850, Cl. 220-253.000.

Creative Industries, Inc.: *See*—
Lake, Connie, 4,551,084, Cl. 425-185.000.

Creative Products Resource Associates, Ltd.: *See*—
Smith, James A.; and Murphy, Betty J., 4,551,481, Cl. 521-52.000.

Credle, William S., Jr., to Coca-Cola Company, The. Reversing mechanism module for a double acting reciprocating pump and method for repairing the pump. 4,550,624, Cl. 74-110.000.

Cribb, W. Raymond: *See*—
Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., 4,551,187, Cl. 148-411.000.

Cristante, Guido, to I.P.E. Nuova Bialetti S.p.A. Household appliance for making ice cream. 4,551,026, Cl. 366-149.000.

Crofts, John G., Sr., to Cummins Engine Company, Inc. Cooling system. 4,550,692, Cl. 123-41.100.

Crosby, John, to Imperial Chemical Industries PLC. Process for the preparation of cyclopropane carboxylic acid esters. 4,551,281, Cl. 260-465.00D.

Cross Company, The: *See*—
Mottershead, Frank R., 4,551,032, Cl. 384-517.000.

Cross, Peter E.; Dickinson, Roger P.; and Thomas, Geoffrey N., to Pfizer Inc. Heterocyclic thromboxane synthetase inhibitors and pharmaceutical compositions containing them. 4,551,468, Cl. 514-339.000.

Crossley, Peter W.; and Smith, Robert D., to Thorn EMI Domestic Appliances Limited. Heating apparatus. 4,551,617, Cl. 219-464.000.

Crow, Morgan L., to Dresser Industries, Inc. Hydraulic jarring tool. 4,550,789, Cl. 175-297.000.

Crown Zellerbach Corporation: *See—*
Weldon, Scott B., 4,551,199, Cl. 162-109.000.
Cummings, Robert, to U.S. Clinical Products, Inc. Flexible plastic sterile closure system for containers. 4,550,842, Cl. 215-232.000.
Cummins Engine Company, Inc.: *See—*
Crofts, John G., Sr., 4,550,692, Cl. 123-41.100.
Cunningham, David C. Radio direction finding system. 4,551,727, Cl. 343-418.000.
Custer, Peter A.; and Bird, George R., to Custer, Peter A. Fluorescent soundtrack readout system. 4,551,827, Cl. 369-101.000.
Cybelec S.A.: *See—*
Aubert, Jean-Daniel; and Fornerod, Andre , 4,550,586, Cl. 72-389.000.
Cybernetic Data Products: *See—*
Levin, Michael M., 4,551,720, Cl. 340-825.520.
Cyborex Laboratories, Inc.: *See—*
Gurr, George P.; and Matheson, Frederick A., 4,551,812, Cl. 364-492.000.
Cypher Systems: *See—*
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., 4,551,719, Cl. 340-825.360.
Czarnocki, Wlodzimierz S., to Motorola, Inc. Electronic pressure transducer. 4,550,611, Cl. 73-708.000.
Czeschka, Franz, to ERNI Elektroapparate GmbH. Solderless electrical connector assembly. 4,550,962, Cl. 339-17.0LC.
D.A.B. Industries, Inc.: *See—*
Lloyd, Kenneth, 4,551,395, Cl. 428-677.000.
da Costa, Bernardo: *See—*
Broughton, Roger; and da Costa, Bernardo, 4,550,736, Cl. 128-731.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kawajiri, Masayuki, 4,551,360, Cl. 427-160.000.
Daicel Chemical Industries, Ltd.: *See—*
Ohtake, Etsuo; and Yamazaki, Kazuhiro, 4,551,389, Cl. 428-402.000.
Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf; Grantz, Helmut; Muenzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,550,774, Cl. 165-104.210.
Wiegard, Klaus; Kinast, Karlheinz; Kleinekathofer, Wolfgang; and Tank, Eggert, 4,551,396, Cl. 428-678.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Sasaki, Makoto; Sasaki, Haruyoshi; and Sato, Hisato, 4,551,280, Cl. 260-465.00D.
Daley, James A. Scoot ball game apparatus. 4,550,911, Cl. 273-94.000.
Dana Corporation: *See—*
Yarnell, James A., 4,550,628, Cl. 74-477.000.
Daniel, Robert P.; and Yglesia, Larry. Multi-chip carrier array. 4,551,788, Cl. 361-403.000.
Daniels, William R.; and Young, John S., to GTE Automatic Electric Incorporated. Arrangement for facilitating external loop analysis testing for a digital switching system. 4,551,585, Cl. 179-175.30R.
Danos, Olivier; Katinka, Michael; and Yaniv, Moshe, to Institut Pasteur. DNA Fragments coding for polypeptides containing at least one antigenic determinant of the papillomavirus, particularly of the HPV 1a type and corresponding polypeptides. 4,551,270, Cl. 260-112.50R.
Darnell, William R.: *See—*
McConnell, Richard L.; Cox, Abraham J.; and Darnell, William R., 4,551,521, Cl. 528-302.000.
Darrow, Russell E.; Ingraham, Glenn J.; Larnerd, John D.; and Nesky, Robert W., to International Business Machines Corporation. Apparatus for connecting contact pins to a substrate. 4,550,493, Cl. 29-739.000.
Da Silva, Artur F., to U.S. Philips Corporation. Coffee maker. 4,550,652, Cl. 99-279.000.
Davidescu, Reghina; de Ceglie, Gaetano J.; Jacquett, Harold W.; and Paluzzi, Joseph A., to General Foods Corporation. Process for preparing a liquid aroma and aromatizing a dry coffee substrate with same. 4,551,345, Cl. 426-594.000.
Davidson, Thomas A.; and Murray, Robert J., to Pennwalt Corporation. Process for preparing novel 7-thioester derivatives of 3H pyrrolo [1,2-a]-imidazole and 8-thioester derivatives of imidazo [1,2-a] pyridine. 4,551,535, Cl. 546-121.000.
Davies, Lawrence W., to Omniglass Ltd. Corner member for a spacer strip for a sealed window unit. 4,551,364, Cl. 428-34.000.
Davis, Darrell E.: *See—*
Victor, Alan M.; and Davis, Darrell E., 4,551,856, Cl. 455-183.000.
Davis, James A.: *See—*
Kang, Jung W.; and Davis, James A., 4,551,391, Cl. 428-462.000.
Davis, Larry: *See—*
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,551,474, Cl. 514-309.000.
Davydov, Anatoly B.: *See—*
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.
Dawson, Jeffery C.: *See—*
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.
Day, Robert A., to General Electric Company. Temperature compensated piezoelectric transducer and lens assembly and method of making the assembly. 4,551,647, Cl. 310-335.000.
Dayco Corporation: *See—*
Mathieu, Julien C., 4,550,484, Cl. 29-434.000.
Deady, Joanne: *See—*
Pecoraro, Theresa A.; Krug, Russell R.; and Deady, Joanne, 4,551,229, Cl. 208-76.000.
Dearborn Chemical Co.: *See—*
Salihar, Mark W., 4,551,261, Cl. 252-88.000.
DeBoer, Herman A., to Genentech, Inc. Microbial hybrid promoters. 4,551,433, Cl. 435-253.000.
DeCaro, Charles J., to Textron Inc. Adjustment means for a driver bit. 4,550,476, Cl. 29-26.00A.
de Ceglie, Gaetano J.: *See—*
Davidescu, Reghina; de Ceglie, Gaetano J.; Jacquett, Harold W.; and Paluzzi, Joseph A., 4,551,345, Cl. 426-594.000.
Jasovsky, George A.; Jacquett, Harold W.; and de Ceglie, Gaetano J., 4,551,344, Cl. 426-594.000.
Dechape, Michel L. Pneumatic gauging circuit. 4,550,592, Cl. 73-37.500.
Deere & Company: *See—*
Boardman, Peter W., 4,550,881, Cl. 242-56.00R.
Deering, Roland F.; and Duir, John H., to Union Oil Company of California. Apparatus with moving bed pressure letdown stage for recovering retorted oil shale. 4,551,206, Cl. 202-99.000.
DeGaynor, G. Scott. Ice bowl freezing apparatus. 4,550,575, Cl. 62-308.000.
Degen, Max F., to Indalex, Division of Indal Limited. Fixed dummy blocks. 4,550,584, Cl. 72-273.000.
Degussa Aktiengesellschaft: *See—*
Drauz, Karlheinz; and Kleemann, Axel, 4,551,562, Cl. 568-771.000.
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,551,548, Cl. 562-402.000.
Strack, Hans; Roebke, Wolfgang; Kneitel, Dieter; and Parr, Ehrfried, 4,551,322, Cl. 423-329.000.
Wagner, Rudolph; and Schiwiora, Harry, 4,551,302, Cl. 420-464.000.
de Jong, Joannes N. M.; and Earle, Richard L., to Sperry Corporation. Rotary variable differential transformer. 4,551,699, Cl. 336-135.000.
De Jongh, Rudolph O.: *See—*
Van Dijk, Cornelis; and De Jongh, Rudolph O., 4,551,441, Cl. 502-159.000.
Dellinger, Eugene L. Orthodontic apparatus and method for treating malocclusion. 4,551,096, Cl. 433-24.000.
De Luca, Giovanna; Di Stazio, Giovanni; Politi, Vincenzo; and Materazzi, Mario, to Polifarma S.p.A. Use of 3-indolepyruvic acid for increasing serotonin. 4,551,471, Cl. 514-419.000.
Deman, Pierre; and Potage, Jean, to Thomson CSF. Apparatus for processing speech in radioelectric transmitter/receiver equipment suitable for transmitting and receiving speech. 4,551,853, Cl. 455-72.000.
DeMarco, Ronald A.: *See—*
Kovacena, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., 4,551,349, Cl. 427-255.600.
Demenais, Claude, to Societe Industrielle de Transports Automobiles "SITA" . Apparatus for charging solids under compression into a receptacle. 4,551,055, Cl. 414-293.000.
Demeny, Gary L.; and Smead, Robert G., to Caterpillar Tractor Co. Apparatus for removing an electrostatic charge from a charge collector. 4,550,678, Cl. 118-630.000.
Denner, Wolf J.; Biernacki, Andreas; and Breitschwerdt, Gunter, to Waldner Laboreinrichtungen GmbH & Co. Hood for the extraction of gases, vapors and suspended matter. 4,550,650, Cl. 98-115.300.
Dennis, Kenrick J.; and Cooke, Robert A. Biplane posting device. 4,550,461, Cl. 12-1.00R.
Dental Preventech, Inc.: *See—*
Krag, Mark D., 4,550,741, Cl. 132-89.000.
Dentsply Research & Development Corp.: *See—*
Blair, John J., 4,551,098, Cl. 433-171.000.
Tateosian, Louis H.; and Wilson, W. Donald, 4,551,486, Cl. 523-212.000.
Denz, Helmut: *See—*
Barho, Hans; and Denz, Helmut, 4,550,704, Cl. 123-481.000.
Depey, Maurice, to Thomson CSF. Method of making substrate injection logic operator structure. 4,550,491, Cl. 29-577.00C.
De Raco, Maurice; and Rey, Pierre, to Eaton S.A.M. Mechanism for the sudden tripping of an electrical contact under the effect of a slow variation in pressure. 4,551,593, Cl. 200-81.00R.
Derendinger, Max, to RCA Corporation. Apparatus for applying a layer of powder to a surface. 4,550,680, Cl. 118-308.000.
DeSantis, Raymond P. Sagger loader and conveyor apparatus and method. 4,550,551, Cl. 53-534.000.
Despic, Aleksandar. Bipolar battery. 4,551,399, Cl. 429-27.000.
Detexomat Machinery Ltd.: *See—*
Hodges, Michael J.; and Scanes, Malcolm K., 4,550,868, Cl. 223-43.000.
Deutscher, Hans-Christian; Kohler, Alfred; Prohaska, Hans; and Schubert, Karl-Friedrich, to ITT Industries, Inc. Windshield wiper assembly. 4,550,469, Cl. 15-250.340.
Deutschmann, Herbert; and Wolters, Gerd-Michael, to MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH. Diesel internal combustion engine. 4,550,568, Cl. 60-612.000.
DeViaris, Guy, to Otis Elevator Company. Transportation system having a cable drawn vehicle. 4,550,663, Cl. 104-119.000.
Devro, Inc.: *See—*
Temple, Stephen; Jones, Nigel J.; and Syrop, Alan N., 4,550,472, Cl. 17-1.00R.

Dewert, Heribert: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,551,304, Cl. 422-4.000.

DeWin, Werner: *See*—
Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, 4,551,328, Cl. 423-607.000.

Dick, William K.: *See*—
Winter, David F.; and Dick, William K., 4,551,633, Cl. 307-147.000.

Dickakian, Ghazi B., to Du Pont de Nemours, E. I., and Company. High anisotropic pitch. 4,551,225, Cl. 208-43.000.

Dickey-john Corporation: *See*—
Sokol, David G., 4,551,801, Cl. 364-424.000.

Dickinson, Roger P.: *See*—
Cross, Peter E.; Dickinson, Roger P.; and Thomas, Geoffrey N., 4,551,468, Cl. 514-339.000.

Diehl, Larry F., Jr.; and Gibbon, Robert M., to Jamak, Inc. Method of forming spark plug boots. 4,551,293, Cl. 264-150.000.

Dietrich, Glory A. Shopping cart safety belt. 4,550,800, Cl. 182-3.000.

DiGiantommaso, Michael: *See*—
Santangelo, John A.; and DiGiantommaso, Michael, 4,550,715, Cl. 128-4.000.

Digital Hydraulics, Inc.: *See*—
Woodworth, Raymond D.; Stoutamore, James F.; and Vanderhoek, Philip S., 4,550,747, Cl. 137-487.500.

Dilling, Peter, to Westvaco Corporation. Dyestuff composition: disperse or vat dye and lignin sulphonate. 4,551,151, Cl. 8-524.000.

Di Milia, Vincent; Maldonado, Juan R.; Speidell, James L.; and Warlaumont, John M., to International Business Machines Corporation. Electrostatic or vacuum pinchuck formed with microcircuit lithography. 4,551,192, Cl. 156-345.000.

DiNatale, Ernest L.; and Yax, Robert J., to Xerox Corporation. Corona generating device. 4,551,784, Cl. 361-225.000.

DiOrio, David W.: *See*—
Charpentier, Albert J.; Redfield, James W.; and DiOrio, David W., 4,551,682, Cl. 328-22.000.

Director General of Agency of Industrial Science and Technology: *See*—
Ishikawa, Masatoshi, 4,551,817, Cl. 364-811.000.

Dischert, Robert A.: *See*—
Meise, William H.; and Dischert, Robert A., 4,551,754, Cl. 358-180.000.

Disko, Harry: *See*—
Kulesza, Ralph J.; Rosenwinkel, Donald A.; and Disko, Harry, 4,550,876, Cl. 239-211.000.

Di Stazio, Giovanni: *See*—
De Luca, Giovanna; Di Stazio, Giovanni; Politi, Vincenzo; and Materazzi, Mario, 4,551,471, Cl. 514-419.000.

Dixon, Voris F. Physical-rehabilitation and exercising apparatus. 4,550,908, Cl. 272-130.000.

Djordjevic, Ilija, to Stanadyne, Inc. Spill control system for distributor pump. 4,550,702, Cl. 123-450.000.

Doak, Kenneth W. Blends of a rubber-modified vinyl chloride resin, an unmodified vinyl chloride resin, and a polymer of a vinyl aromatic monomer and an unsaturated dicarboxylic acid anhydride monomer. 4,551,500, Cl. 525-71.000.

Dobbins, Frederick A.: *See*—
Owensby, Joseph E.; Rupp, Jody W.; Dobbins, Frederick A.; and Waldrop, Thomas E., 4,550,548, Cl. 53-434.000.

Dockner, Toni; and Krug, Herbert, to BASF Aktiengesellschaft. Carrying out organic condensation reactions at elevated temperatures by feeding the starting materials into the bottom of a reactor charged with mineral oil followed by product distillation. 4,551,528, Cl. 544-242.000.

Dr. Ing. Rudolf Hell GmbH: *See*—
Jung, Eggert, 4,551,751, Cl. 358-75.000.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,551,464, Cl. 514-312.000.

Dominiani, Frank J., Jr.; and Annarelli, Dennis C., to FMC Corporation. Treatment of concentrated phosphoric acid. 4,551,320, Cl. 423-321.00R.

Don Mowry Flexo Parts, Inc.: *See*—
Mowry, Donald E., 4,551,124, Cl. 493-128.000.

Donais, Norman; and Nitowski, Ronald, to Siemon Company, The. Hinged cover and label assembly for connector block. 4,550,964, Cl. 339-44.00M.

Donner, Klaus: *See*—
Bitsch, Harald; Donner, Klaus; Hasselmann, Heinz; and Horbach, Rainer, 4,550,664, Cl. 105-180.000.

Doppelfeld, Ille-Stephanie: *See*—
Hilboll, Gerd; Doppelfeld, Ille-Stephanie; and Prop, Gerrit, 4,551,455, Cl. 514-252.000.

Doria, Gianfederico; Passarotti, Carlo; Arcari, Giuliana; and Buttinoni, Ada, to Farmitalia Carlo Erba, S.p.A. Substituted thiazolo[3,2-a]pyrimidines and process for their preparation. 4,551,457, Cl. 514-258.000.

Dorr, George D.: *See*—
Lansinger, Jere R.; Dorr, George D.; and Farago, Paul L., 4,550,675, Cl. 116-28.100.

Dorr-Oliver Incorporated: *See*—
Lenac, Nevio, 4,551,248, Cl. 210-404.000.

Doty, Gerald A.; and Hunter, William E., Jr., to Gateway Industries, Inc. Safety belt buckle. 4,550,474, Cl. 24-633.000.

Doughty, Carolyn A., to AT&T Bell Laboratories. Method and apparatus for sending a data message to a selected station during a silent interval between ringing. 4,551,581, Cl. 179-2.00A.

Doughty, Robert L.: *See*—
Duga, Robert J.; Kulig, Constantine W.; Doughty, Robert L.; Douglas, Robert J.; and Andersen, Robert P., 4,551,163, Cl. 65-129.000.

Douglas, Ellwood S.: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,550,792, Cl. 177-25.000.

Douglas, Robert J.: *See*—
Duga, Robert J.; Kulig, Constantine W.; Doughty, Robert L.; Douglas, Robert J.; and Andersen, Robert P., 4,551,163, Cl. 65-129.000.

Douglass, Randle; Jacquin, H. George; Chewey, Paul M.; Galvan, Paul A.; and Naragon, Richard S. Dual pressure solid propellant control system. 4,550,888, Cl. 244-3.220.

Douthitt Corporation: *See*—
Maher, Robert J.; and Tooson, Ronald, 4,551,016, Cl. 355-91.000.

Douty, George H.: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,550,960, Cl. 339-14.00R.

Dow Chemical Company, The: *See*—
Johnston, Howard; and Troxell, Lillian H., 4,551,170, Cl. 71-94.000.

Dow, John, Jr.; Oetting, William A.; and Yessian, Richard J., to Lockheed Electronics Company, Inc. Microprocessor controlled fluid dispensing system. 4,550,859, Cl. 222-26.000.

Dowa Company, Ltd.: *See*—
Miyahara, Kingo, 4,551,089, Cl. 431-116.000.

Dowe Egberts Koninklijke Tabaksfabrier Koffiebranderijen Theehandel N.V.: *See*—
Noomen, Pieter J., 4,550,858, Cl. 222-1.000.

Doyle, Arthur; and Freeman, Frank M., to E. R. Squibb & Sons, Inc. Adhesive composition resistant to biological fluids. 4,551,490, Cl. 524-22.000.

Doyle, Gerald; Eriksen, Kenneth A.; and Pruett, Roy L., to Exxon Research and Engineering Co. Bimetallic carbonyl hydroformylation catalysts. 4,551,543, Cl. 556-14.000.

Draeger, Brigitte; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Process and reagent for the determination of blood glucose in haemolysed whole blood. 4,551,427, Cl. 435-14.000.

Draexler, Adolf, to Chemische Werke Huels Aktiengesellschaft. Composite materials and composite building elements based on EP(D)M. 4,551,392, Cl. 428-495.000.

Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., to Harris Corporation. Wavelength division multiplexed fiber-optic cable system with non-unique terminal types. 4,551,829, Cl. 370-3.000.

Drauz, Karlheinz; and Kleemann, Axel, to Degussa Aktiengesellschaft. Process for the production of dihydroxybenzenes. 4,551,562, Cl. 568-771.000.

Dreher, Carl T., to Recognition Equipment Incorporated. Intelligent key display. 4,551,717, Cl. 340-712.000.

Drelinger, Sanford. Flute headjoints having replaceable lip plates and a method of replicating same. 4,550,637, Cl. 84-384.000.

Dresser Industries, Inc.: *See*—
Bridge, Michael L., 4,550,599, Cl. 73-151.000.
Carmichael, Jerry H.; and Wellington, Charles H., 4,551,823, Cl. 367-35.000.
Crow, Morgan L., 4,550,789, Cl. 175-297.000.
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.
Miller, John E., 4,550,646, Cl. 92-128.000.

Drogosch, Edward J. Coping system. 4,550,535, Cl. 52-60.000.

Drost, Cornelis J., to Cornell Research Foundation, Inc. Ultrasonic transducer array with controlled excitation pattern. 4,550,606, Cl. 73-626.000.

Drouillard, James R., to General Motors Corporation. Window stabilizing mechanism. 4,550,529, Cl. 49-348.000.

Drutchas, Gilbert H.; and Borza, John S., to TRW Inc. Method and apparatus for sensing relative movement between members. 4,550,597, Cl. 73-118.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Unsymmetrical bis-carbamate compounds. 4,551,472, Cl. 514-477.000.

DuBois, Chester G., to Outboard Marine Corporation. Fluid driven pump with one-way valve in fluid inlet. 4,551,076, Cl. 417-395.000.

Duehr, Bernard W., Jr.: *See*—
Ottestad, Jack B.; and Duehr, Bernard W., Jr., 4,550,784, Cl. 173-114.000.

Duga, Robert J.; Kulig, Constantine W.; Doughty, Robert L.; Douglas, Robert J.; and Andersen, Robert P., to Emhart Industries, Inc. Electronic glass feeder plunger operating mechanism. 4,551,163, Cl. 65-129.000.

Duir, John H.: *See*—
Deering, Roland F.; and Duir, John H., 4,551,206, Cl. 202-99.000.

Dukkers, Hendricus W. A. Resting device with rotatable covering envelope. 4,550,457, Cl. 5-414.000.

Dumoulin, Andre : *See*—
Bouffard, Jean; Dumoulin, Andre ; and Lederhose, Edgar K., 4,550,558, Cl. 57-58.520.

Duo-Fast Corporation: *See*—
Schwartzenberger, Julius W., 4,550,643, Cl. 91-356.000.

Duplessis, Philippe: *See*—
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, 4,551,852, Cl. 455-33.000.

Du Pont de Nemours, E. I., and Company: *See—*
Aerts, Armand, 4,551,492, Cl. 524-40.000.
Cohen, Abraham B.; and Webers, Vincent J., 4,551,415, Cl. 430-281.000.
Dickakian, Ghazi B., 4,551,225, Cl. 208-43.000.
Fletcher, Richard J.; and Wischusen, Henry, III, 4,550,834, Cl. 206-611.000.
Freytag, William J.; and Chang, Shung-Ho, 4,551,426, Cl. 435-7.000.
Fryd, Michael; and Goff, David L., 4,551,522, Cl. 528-351.000.
Liu, John J., 4,551,552, Cl. 564-448.000.
Milford, George N., Jr., 4,551,549, Cl. 562-437.000.
Robbins, Gordon B., 4,551,544, Cl. 556-40.000.

Duppengiesser, Dieter: *See—*
Hutzenlaub, Armin S. P.; and Duppengiesser, Dieter, 4,550,882, Cl. 242-56.600.

Durbin, Dennis, to Beckman Instruments, Inc. Tachometer and rotor identification apparatus for centrifuges. 4,551,715, Cl. 340-671.000.

Duret, Jean, to Vallourec S.A. Joint for steel tubes. 4,550,937, Cl. 285-334.000.

Durkoppwerke GmbH: *See—*
Kastrup, Eberhard, 4,550,672, Cl. 112-293.000.

Dusch, Albert, to Pfaff Industriemaschinen GmbH. Material presser device for a sewing machine. 4,550,671, Cl. 112-235.000.

Dusza, John P.; and Albright, Jay D., to American Cyanamid Company. Pyridyl imidazo[1,2-a]pyrimidines. 4,551,530, Cl. 544-281.000.

Duval Corporation: *See—*
Wilson, Alex T., 4,551,213, Cl. 204-111.000.

Dyatlova, Nina M.: *See—*
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Hanisch, Horst, 4,551,541, Cl. 549-215.000.

Dyneer Corporation: *See—*
Kraft, Derald H.; and Hitchcock, Gary L., 4,551,122, Cl. 474-170.000.
Thomey, Henry W., 4,551,120, Cl. 474-135.000.

Dytjuk, Leonid T.: *See—*
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.

E. B. Eddy Forest Products, Ltd.: *See—*
Gladish, Herbert E., 4,550,823, Cl. 198-805.000.

E.N.I. Ente Nazionale Incorporated: *See—*
Canella, Marco; Marghinotti, Daniele; Bernardi, Adriano; and Sodini, Giancarlo, 4,551,335, Cl. 426-44.000.

E. R. Squibb & Sons, Inc.: *See—*
Doyle, Arthur; and Freeman, Frank M., 4,551,490, Cl. 524-22.000.
Slusarchyk, William A.; and Kronenthal, David, 4,551,276, Cl. 260-239.00A.
Treuner, Uwe D., 4,551,277, Cl. 260-239.00A.

Eagen, Michael J.: *See—*
Juve, Robert J.; and Eagen, Michael J., 4,550,682, Cl. 118-425.000.

Eagle, Jon R. Attic ventilation system. 4,550,648, Cl. 98-37.000.

Eagle Machinery Company: *See—*
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,550,792, Cl. 177-25.000.

Earle, Richard L.: *See—*
de Jong, Joannes N. M.; and Earle, Richard L., 4,551,699, Cl. 336-135.000.

Eastman Kodak Company: *See—*
Brust, David P.; Neumann, Stephen M.; and Weissberger, Edward, 4,551,411, Cl. 430-216.000.
Elam, Edward U.; and Middleton, Michael L., 4,551,523, Cl. 536-119.000.
Elvin, Warren G., 4,551,006, Cl. 355-14.0FU.
Lemke, James U., 4,550,492, Cl. 29-603.000.
McConnell, Richard L.; Cox, Abraham J.; and Darnell, William R., 4,551,521, Cl. 528-302.000.
Morris, John C.; and Jackson, Winston J., Jr., 4,551,520, Cl. 528-302.000.

Eaton Corporation: *See—*
Lauer, Ernst H.; and Reynolds, Joseph D., 4,550,627, Cl. 74-475.000.
Mahon, Joseph J., 4,551,590, Cl. 200-38.00R.
Martin, George; and Broucksou, Robert H., 4,550,625, Cl. 74-335.000.
Smith, Stanley K.; and Rozsi, Donald J., 4,551,808, Cl. 364-474.000.
Smyth, Robert R., 4,551,802, Cl. 364-424.100.

Eaton S.A.M.: *See—*
De Raco, Maurice; and Rey, Pierre, 4,551,593, Cl. 200-81.00R.

Echard, Richard A.: *See—*
Cookson, John A.; Schatzka, Richard L.; Echard, Richard A.; and Scheer, Gary W., 4,551,718, Cl. 340-825.160.

Eckert, Guenter: *See—*
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.

Eckert, Theodor, to Ciba-Geigy Corporation. Pharmaceutical preparations for topical application which contain salts of alkanecarboxylic acids. 4,551,475, Cl. 514-408.000.

Eckstein, John P., to American Can Company. Multiple layer flexible sheet structure. 4,551,371, Cl. 428-36.000.

Eda, Kazuo; Kikuchi, Yasuharu; Makino, Osamu; and Matsuoka, Michio, to Matsushita Electric Industrial Co., Ltd. Voltage-dependent resistor and method of making the same. 4,551,268, Cl. 252-519.000.

Edinen Centar Po Chimia: *See—*
Boyadjiev, Lyubomir A., 4,551,252, Cl. 210-638.000.

Edwards, John C.; and Ford, Russell A., to American Standard Inc. Compressor intercooler. 4,550,775, Cl. 165-111.000.

EER Products Inc.: *See—*
Martin, Gerald L., 4,550,773, Cl. 165-54.000.

EerNisse, Errol P., to Quartztronics, Inc. Resonator pressure transducer. 4,550,610, Cl. 73-702.000.

Effland, Richard C.; Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Incorporated. Methods of alleviating convulsions and pain employing 4-aryloxy-1,2,3,4 tetrahydroisoquinolines. 4,551,474, Cl. 514-309.000.

Egawa, Takeshi: *See—*
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,550,993, Cl. 354-402.000.

Ehiro, Takashi; Tanaka, Teruaki; and Yamanaka, Eisuke, to Kawasaki Steel Corporation. Method of producing steel H-sheet pile. 4,550,582, Cl. 72-234.000.

Ehrend, Helfried: *See—*
Sauerbier, Michael; and Ehrend, Helfried, 4,551,505, Cl. 525-346.000.

Ehrfeld, Wolfgang: *See—*
Becker, Erwin; Ehrfeld, Wolfgang; Fritz, Wolfgang; Steinhaus, Harald; and Bley, Peter, 4,551,157, Cl. 55-17.000.

Ehrlich, Josef, to Outboard Marine Corporation. Internal combustion engine with disc inlet valve. 4,550,696, Cl. 123-73.00D.

Eickmann, Karl. Drive shaft arrangement to reduce leakage in fluid machines. 4,550,644, Cl. 91-486.000.

Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Polyhalogenoaromatic compounds for liquid crystal compositions. 4,551,264, Cl. 252-299.620.

Eisai Co., Ltd.: *See—*
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.
Tagaya, Ryosaku, 4,551,022, Cl. 356-406.000.

Eisenzimmer, George W., to Goodyear Tire & Rubber Company, The. Heavy duty hose crimper. 4,550,587, Cl. 72-402.000.

Ekland, Joseph D.: *See—*
Roemmele, Carl F.; and Ekland, Joseph D., 4,550,708, Cl. 125-15.000.

Elam, Edward U.; and Middleton, Michael L., to Eastman Kodak Company. Preparation of saccharide acetoacetates. 4,551,523, Cl. 536-119.000.

Electro-Biology, Inc.: *See—*
Talish, Roger J.; and Banko, Victor F., 4,550,714, Cl. 128-1.500.

El-Hag, Nabil A.; Cochran, Stuart A.; Schwabe, Kenneth R.; Carricato, Louis; and Shanbhag, Sudhakar P., to General Foods Corporation. Process for preparing frozen par-fried potatoes. 4,551,340, Cl. 426-437.000.

Elliott, Charles T.; and White, Anthony M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Photoconductive detector with an A/C bias and responsivity dependent upon the polarity of the bias. 4,551,623, Cl. 250-211.00R.

Ellis, Paul E., Jr.: *See—*
Hsu, Chao-Yang; and Ellis, Paul E., Jr., 4,551,559, Cl. 568-454.000.

Ellis, Stafford M., to Marconi Avionics Limited. Clamp arrangements. 4,550,836, Cl. 211-41.000.

Ellison, Joseph E.: *See—*
Redman, James; and Ellison, Joseph E., 4,550,890, Cl. 248-59.000.

Elter, Michael R., to Xerox Corporation. Controller for a fusing device of an electrophotographic printing machine. 4,551,007, Cl. 355-14.0FU.

Elves, John; and Ley, Stephen J., to Chicopee. Absorbent pads. 4,551,377, Cl. 428-137.000.

Elvin, Warren G., to Eastman Kodak Company. Thermal conservation apparatus. 4,551,006, Cl. 355-14.0FU.

Emhart Industries, Inc.: *See—*
Clouser, Michael T.; and Coulter, Robert S., 4,550,874, Cl. 236-1.00G.
Duga, Robert J.; Kulig, Constantine W.; Doughty, Robert L.; Douglas, Robert J.; and Andersen, Robert P., 4,551,163, Cl. 65-129.000.
Simpson, Roger A., 4,551,707, Cl. 340-287.000.

Emmel, David G., to American Standard Inc. Traffic control system for single track railroad. 4,550,889, Cl. 246-28.00R.

Ems-Inventa AG: *See—*
Rehmann, Robert, 4,550,661, Cl. 102-251.000.

Endel, Dieter; and Billerbeck, Gerd, to IBU Betten-Union GmbH & Co. KG. Orthopedic pillow. 4,550,459, Cl. 5-437.000.

Endress u. Hauser GmbH u. Co.: *See—*
Kroner, Holger, 4,551,785, Cl. 361-284.000.

Energy Conversion Devices, Inc.: *See—*
Sapru, Krishna; Hong, Kuochih; Fetcenko, Michael A.; and Venkatesan, Srinivasan, 4,551,400, Cl. 429-94.000.

Energy Cycle, Inc.: *See—*
Martin, John H., 4,551,243, Cl. 210-180.000.

Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., to Cassella Aktiengesellschaft; and Dresser Industries, Inc. Water soluble co-polymers. 4,551,513, Cl. 526-307.100.

Englehardt, Paul, to PEI, Inc. Truck bed closure. 4,550,945, Cl. 296-100.000.

Engnell, David: *See*—
Rottler, Donald; and Engnell, David, 4,550,530, Cl. 51-34.00R.

Engstrom, Nils M. L., to Hellgren, Lars G. I.; and Vincent, Jan G. Separable column for chromatography with a detection and signal device and an elution system - in combination or separate. 4,550,594, Cl. 73-61.10C.

Enlow, William P.: *See*—
Hechenbleikner, Ingenuin; and Enlow, William P., 4,551,539, Cl. 548-412.000.
Hechenbleikner, Ingenuin; and Enlow, William P., 4,551,540, Cl. 548-531.000.

Ensamblaje y Manipulacion Industrial, S.A. (EMINSA): *See*—
Cano, Manuel I., 4,551,193, Cl. 156-423.000.

Envirotech Corporation: *See*—
Jackson, Michael A., 4,551,285, Cl. 261-87.000.

Epel, Joseph N.; and Wilkinson, Robert E., to Budd Company, The. Compression molding apparatus having vacuum chamber. 4,551,085, Cl. 425-405.00R.

Epina, August P.: *See*—
Permut, Ronald; Cope, Robert; Apple, James; Epina, August P.; and Munro, Frederick G., 4,550,884, Cl. 242-189.000.

Epson Corporation: *See*—
Shingu, Hiroshi, 4,550,980, Cl. 350-349.000.

Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Selectively absorbent layer for solar collectors, and method of making it. 4,551,328, Cl. 423-607.000.

Erburt, George A.: *See*—
Gellman, Gary; Erburt, George A.; and Roe, James E., 4,551,343, Cl. 426-549.000.

Ericson, Charles P.; and Shadzi, Bahram, to Magnegic Peripherals. High speed coating process for magnetic disks. 4,551,355, Cl. 427-48.000.

Eriksen, Kenneth A.: *See*—
Doyle, Gerald; Eriksen, Kenneth A.; and Pruett, Roy L., 4,551,543, Cl. 556-14.000.

ERNI Elektroapparate GmbH: *See*—
Czeschka, Franz, 4,550,962, Cl. 339-17.0LC.

Erwin Kampf GmbH & Co. Maschinenfabrik: *See*—
Hutzenlaub, Armin S. P.; and Duppengiesser, Dieter, 4,550,882, Cl. 242-56.600.

Eskelinen, Pekka, to Valmet Oy. Method and arrangement for guiding a paper web from the press section to the drying section. 4,551,203, Cl. 162-202.000.

Esposito, John A.: *See*—
Kock, Ronald W.; and Esposito, John A., 4,551,191, Cl. 156-276.000.

Essex Group, Inc.: *See*—
Lavallee, Francois A., 4,551,398, Cl. 428-383.000.

Estey, Herman C. Sanitary ashtray system. 4,550,738, Cl. 131-236.000.

ETA S.A. Fabriques D'Ebauches: *See*—
Antognini, Luciano; and Guerin, Yves, 4,551,665, Cl. 318-696.000.

Ethicon, Inc.: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,550,729, Cl. 128-325.000.
Shalaby, Shalaby W.; and Schipper, Edgar S., 4,550,730, Cl. 128-335.500.

Ethyl Corporation: *See*—
Li, Hsueh M., 4,551,317, Cl. 423-300.000.
Ragan, Gary S.; and Jones, Jesse D., 4,551,485, Cl. 523-212.000.
Raley, Garland E.; and Goodrum, Richard W., 4,550,546, Cl. 53-425.000.

Etudes et Fabrication Dowell Schlumberger: *See*—
Marshall, Lloyd B.; and Ghebrid, Faycal, 4,550,935, Cl. 285-18.000.

Euler, John W., to Lambert Brake Corporation. Mechanical clutch. 4,550,817, Cl. 192-70.230.

Eurecat-Europeene de Retraitement de Catalyseurs: *See*—
Berrebi, Georges, 4,551,437, Cl. 502-5.000.

Evans, Alan G., to United States of America, Navy. Method for determining the magnitude of earth's gravity. 4,550,601, Cl. 73-382.00R.

Evans Cooling Associates: *See*—
Evans, John W., 4,550,694, Cl. 123-41.020.

Evans, John W., to Evans Cooling Associates. Process and apparatus for cooling internal combustion engines. 4,550,694, Cl. 123-41.020.

Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; and Everitt, Delmar K., 4,550,910, Cl. 273-86.00B.

Exler, Heribert: *See*—
Hofbauer, Edwin; Lechner, Peter; and Exler, Heribert, 4,551,051, Cl. 414-21.000.

Exner, Gerhard: *See*—
Raschke, Klaus; and Exner, Gerhard, 4,551,063, Cl. 415-115.000.

Exquisite Form Industries, Inc.: *See*—
Porco, Frank, 4,550,734, Cl. 128-460.000.

Exxon Research and Engineering Co.: *See*—
Doyle, Gerald; Eriksen, Kenneth A.; and Pruett, Roy L., 4,551,543, Cl. 556-14.000.
Merchant, Philip; and Lacy, Sylvia M., 4,551,239, Cl. 208-188.000.

Ezer, Elemer: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.

Ezra C. Lundahl, Inc.: *See*—
Lundahl, E. Cordell; Wiser, James G.; Thornley, W. Ray; and Jensen, Laurel H., 4,550,554, Cl. 56-294.000.

Falk, Gertrud, to Siemens Aktiengesellschaft. Spectrometry plasma burner. 4,551,609, Cl. 219-121.0PR.

Falk, Roland: *See*—
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.

Fanuc Ltd: *See*—
Amemiya, Yoichi; Ishida, Hiroshi; Takekoshi, Yashitaka; and Ushiyama, Shigeyuki, 4,551,676, Cl. 324-208.000.
Ishida, Hiroshi; and Taniguchi, Mitsuyuki, 4,551,662, Cl. 318-316.000.

Farago, Paul L.: *See*—
Lansinger, Jere R.; Dorr, George D.; and Farago, Paul L., 4,550,675, Cl. 116-28.100.

Farmitalia Carlo Erba, S.p.A.: *See*—
Doria, Gianfederico; Passarotti, Carlo; Arcari, Giuliana; and Buttinoni, Ada, 4,551,457, Cl. 514-258.000.
Faustini, Franco; Passarotti, Carlo; Ceserani, Roberto; and Gandolfi, Carmelo, 4,551,476, Cl. 514-461.000.

Farrey, Merlyn F., to Fomo Products, Inc. Foam gun for mixing and dispensing two reactants. 4,550,863, Cl. 222-145.000.

Farrow, Robert I.; and Clark, Richard L., to American Multimedia, Inc. Aligning means for tape splicer. 4,551,190, Cl. 156-159.000.

Fastaia, Anthony J.: *See*—
Carll, Richard T.; Fastaia, Anthony J.; and von Nieda, Kurt, 4,551,832, Cl. 370-58.000.

Faustini, Franco; Passarotti, Carlo; Ceserani, Roberto; and Gandolfi, Carmelo, to Farmitalia Carlo Erba S.p.A. 13,14-Didehydro-prostaglandins and process for their preparation. 4,551,476, Cl. 514-461.000.

Fay, James P., Jr.: *See*—
Fay, James P., Sr.; and Fay, James P., Jr., 4,550,861, Cl. 222-78.000.

Fay, James P., Sr.; and Fay, James P., Jr., to Pro-Tex Limited Partnership. Lachrymator/dye dispenser. 4,550,861, Cl. 222-78.000.

Feder, Darryl. Method for metalizing metal bodies. 4,551,354, Cl. 427-46.000.

Federal-Mogul Corporation: *See*—
Roemmele, Carl F.; and Ekland, Joseph D., 4,550,708, Cl. 125-15.000.

Fehrenkamp, William; Pater, Arnold R.; and Brummel, Arthur D., to AMF Incorporated. Telemetry system adapter. 4,551,824, Cl. 367-76.000.

Felstet, Rickerd M. Excavator bucket with detachable implements. 4,550,512, Cl. 37-117.500.

Fender, David A. Ventilated athletic cap. 4,550,445, Cl. 2-181.600.

Fenech, Brian. Electro luminescence visual device. 4,551,363, Cl. 428-28.000.

Fenton, Donald M., to Union Oil Company of California. Arsenic removal from shale oils. 4,551,237, Cl. 208-251.00R.

Ferag AG: *See*—
Meier, Jacques, 4,550,822, Cl. 198-461.000.

Ferdinandi, Frank: *See*—
Fisher, John H.; and Ferdinandi, Frank, 4,551,795, Cl. 364-139.000.

Ferguson, Robert J., to Simpson Industries, Inc. Driveshaft coupling with elastomer damper. 4,551,115, Cl. 464-83.000.

Ferm, Richard L., to Chevron Research Company. Heat exchanger antifoulant. 4,551,226, Cl. 208-48.0AA.

Ferris, Michael J.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board racing game. 4,550,917, Cl. 273-246.000.

Fetcenko, Michael A.: *See*—
Sapru, Krishna; Hong, Kuochih; Fetcenko, Michael A.; and Venkatesan, Srinivasan, 4,551,400, Cl. 429-94.000.

Feutrel, Claude, to Commissariat a l'Energie Atomique. Nuclear reactor fuel assembly end fitting. 4,551,300, Cl. 376-364.000.

Filippov, Jury I.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.

Finney, Roy P.; Trick, Robert E.; and Lynch, Henry W., to Medical Engineering Corporation. Implantable penile erectile system. 4,550,719, Cl. 128-79.000.

Finster, Emma R.; and Finster, Peter W. Adjustable implement holder for stepladders. 4,550,803, Cl. 182-129.000.

Finster, Peter W.: *See*—
Finster, Emma R.; and Finster, Peter W., 4,550,803, Cl. 182-129.000.

Fiore, John W. Cervical support pillow. 4,550,458, Cl. 5-434.000.

Firestone Tire & Rubber Company, The: *See*—
Kang, Jung W.; and Davis, James A., 4,551,391, Cl. 428-462.000.

Fischer, Dan E., to Ultradent, Inc. Method of preparing gingival area for dental crowns. 4,551,100, Cl. 433-218.000.

Fischer, Dieter, to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik. Document scanning apparatus with photosensor and gas discharge readout. 4,551,622, Cl. 250-211.00R.

Fischer, Kurt; and Muller, Franz, to Georg Fischer Aktiengesellschaft. Apparatus for compacting granular molding materials. 4,550,765, Cl. 164-194.000.

Fischer & Porter Company: *See*—
Herzl, Peter J., 4,550,614, Cl. 73-861.190.
Fisher, John H.; and Ferdinandi, Frank, to Precision Grinding Limited. Apparatus for use in monitoring a plurality of variable parameters. 4,551,795, Cl. 364-139.000.
Fisher, Stan E.: *See*—
Goegelein, Gerald W.; Longmore, Paul H.; and Fisher, Stan E., 4,551,837, Cl. 371-25.000.
Flanagan, William T.: *See*—
Aicher, Frederick T.; Martin, James R., Sr.; and Flanagan, William T., 4,550,961, Cl. 339-14.00R.
Flanigen, Edith M.: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith M., 4,551,236, Cl. 208-112.000.
Fleishman, Gregg. Portable furniture. 4,550,950, Cl. 297-440.000.
Fleming, James W., to Lawson & Jones Limited. Fast food serving tray. 4,550,873, Cl. 229-30.000.
Fletcher, Bruce W.; Rydell, Mark A.; and Reese, Edward W., to Angiomedics, Inc. Method for making a catheter with a soft, deformable tip. 4,551,292, Cl. 264-139.000.
Fletcher, George R., Jr.; Messick, George H., Jr.; Roby, Charles K.; and Huey, Cecil O., Jr., to Tungsten Industries, Inc. Automated machining method. 4,550,532, Cl. 51-288.000.
Fletcher, Richard J.; and Wischusen, Henry, III, to Du Pont de Nemours, E. I., and Company; and Rock-Tenn Co. Self-erecting end-load top-dispensing container. 4,550,834, Cl. 206-611.000.
Flick, Gary D.; and Reinshagen, John H., to Pfizer Inc. Flush edge protected metal laminates. 4,551,219, Cl. 204-290.00R.
Flugger, Ray T., to King, Wayne. Muffler for exhaust gases. 4,550,799, Cl. 181-244.000.
FMC Corporation: *See*—
Dominiani, Frank J., Jr.; and Annarelli, Dennis C., 4,551,320, Cl. 423-321.00R.
McTamaney, Louis S.; Bisbee, Gary W.; Kettlety, Robert W.; and Konsevich, James L., 4,551,730, Cl. 346-33.0WL.
Fockens, Tallienco W. H., to N.V. Nederlandsche Apparatenfabriek Nedap. Electronic detection system for detecting a responder including a frequency divider. 4,551,712, Cl. 340-572.000.
Folson, Henry J., to Illinois Tool Works Inc. Brake for twin wheel casters. 4,550,808, Cl. 188-1.120.
Fomo Products, Inc.: *See*—
Farrey, Merlyn F., 4,550,863, Cl. 222-145.000.
Forcey, Thomas H.: *See*—
Simon, Frederick A.; and Forcey, Thomas H., 4,550,944, Cl. 296-70.000.
Ford Motor Company: *See*—
Gale, Ronald J., 4,550,815, Cl. 192-30.00W.
Simon, Frederick A.; and Forcey, Thomas H., 4,550,944, Cl. 296-70.000.
Stojek, Dieter, 4,551,284, Cl. 261-44.00B.
Ford, Russell A.: *See*—
Edwards, John C.; and Ford, Russell A., 4,550,775, Cl. 165-111.000.
Foresto, Sam. Burning apparatus with means for heating and cleaning polluted products of combustion. 4,550,669, Cl. 110-245.000.
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, to Metallgesellschaft Aktiengesellschaft; and Mannesmann Aktiengesellschaft. Process of producing liquid carbon-containing iron. 4,551,172, Cl. 75-11.000.
Formhals, C.: *See*—
Tarozzi, R. A.; and Formhals, C., 4,550,864, Cl. 222-209.000.
Fornerod, Andre : *See*—
Aubert, Jean-Daniel; and Fornerod, Andre , 4,550,586, Cl. 72-389.000.
Fornes, Gaston G. Nut kernel extractor. 4,550,495, Cl. 30-120.300.
Forrest, William E., to Advanced Evacuation Systems. Personal high rise evacuation apparatus. 4,550,801, Cl. 182-7.000.
Forschungsgesellschaft fur Biomedizinische Technik e.V.: *See*—
Trispel, Stephan; and Rau, Gunter, 4,550,990, Cl. 351-243.000.
Forster, Martin. Device for supplying farm animals with a liquid feed. 4,550,685, Cl. 119-71.000.
Foshee, William R.: *See*—
Best, Walter E.; and Foshee, William R., 4,550,581, Cl. 70-422.000.
Foster, Terry L. Assemblage formed of a mass of interlocking structural elements. 4,550,539, Cl. 52-236.100.
Foster, Wayne G.: *See*—
Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., 4,550,670, Cl. 112-121.110.
Fothergill, John C.: *See*—
Cranfield, Brain A.; Fothergill, John C.; and Wolfe, Susan V., 4,551,499, Cl. 524-487.000.
Foundry Technology, Inc.: *See*—
McMullen, Carl R.; and Campbell, Marshall S., 4,550,768, Cl. 164-456.000.
Fournier, Jean; Patron, Henri; and Meynard, Paul, to Stein Industrie. System for interlocking closely ajacent vertical lengths of tube in a heat exchanger having loops. 4,550,777, Cl. 165-162.000.
Fox, Paul L.: *See*—
Buckley, Galen L.; and Fox, Paul L., 4,550,482, Cl. 29-412.000.
Fraignier, Bernard; and Gery, Daniel E., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Multi axis force and moments transducer. 4,550,617, Cl. 73-862.040.
Frailey, Richard C.; and Symborski, Alex P., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass filaments. 4,551,160, Cl. 65-2.000.
Fraioli, Donato M. Air-supported structure for sport activities. 4,550,533, Cl. 52-2.000.
Francis, Alan W., to S. C. Johnson & Son, Inc. Elapsed time indicator. 4,550,676, Cl. 116-206.000.
Francotyp-Postalia GmbH: *See*—
Schulze, Wolfgang, 4,551,188, Cl. 156-441.500.
Frangatos, Gerassimos, executor: *See*—
Braid, Milton, deceased, 4,551,259, Cl. 252-48.200.
Frank-Neumann, Michel; Sedrati, Madjid; Vigneron, Jean-Pierre; and Bloy, Vincente, to Roussel Uclaf. Process of preparing alkyl cis chrysanthemates. 4,551,545, Cl. 560-124.000.
Frankl & Kirchner GmbH & Co. KG Fabrik fur Elektromotoren u. elektrische Apparate: *See*—
Harry, Alan J., 4,550,814, Cl. 192-18.00B.
Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,550,655, Cl. 99-450.400.
Freeman, Frank M.: *See*—
Doyle, Arthur; and Freeman, Frank M., 4,551,490, Cl. 524-22.000.
French, James C.: *See*—
Kern, Donald L.; Hokanson, Gerard C.; and French, James C., 4,551,529, Cl. 544-265.000.
Fresenius AG: *See*—
Mathieu, Bernd; and Weber, Wolfram, 4,551,147, Cl. 604-405.000.
Frey, Gunter: *See*—
Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, 4,551,428, Cl. 435-19.000.
Frey, William L. Grinding box. 4,550,531, Cl. 51-125.000.
Freytag, William J.; and Chang, Shung-Ho, to Du Pont de Nemours, E. I., and Company. Heterogeneous immunoassay for digoxin using ouabain as a separation means. 4,551,426, Cl. 435-7.000.
Friedle, Alvin A. Three-dimensional viewing device. 4,550,978, Cl. 350-138.000.
Friml, Zdenek: *See*—
Skvara, Frantisek; Kolar, Karel; Zadak, Zdenek; Friml, Zdenek; and Novotry, Jaroslay, 4,551,176, Cl. 106-90.000.
Frisz, James O. Submerged water wheel. 4,551,066, Cl. 416-119.000.
Fritz, Wolfgang: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; Fritz, Wolfgang; Steinhaus, Harald; and Bley, Peter, 4,551,157, Cl. 55-17.000.
Fritzsche, Klaus-Dietrich: *See*—
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.
Frommer, Elmar: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,551,318, Cl. 423-265.000.
Fryd, Michael; and Goff, David L., to Du Pont de Nemours, E. I., and Company. Process for making photopolymerizable aromatic polyamic acid derivatives. 4,551,522, Cl. 528-351.000.
Fuchs, Uwe: *See*—
Morper, Manfred; and Fuchs, Uwe, 4,551,250, Cl. 210-603.000.
Fuji Electric Company, Ltd.: *See*—
Kuroki, Kazuo, 4,551,635, Cl. 307-254.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakakiyama, Ryuzo, 4,550,816, Cl. 192-0.052.
Fuji Oil Company, Limited: *See*—
Kawasaki, Yoichi; and Katayama, Tsutomu, 4,551,351, Cl. 426-656.000.
Fuji Photo Film Co., Ltd.: *See*—
Agano, Toshitaka, 4,551,626, Cl. 250-327.200.
Arai, Yoshihiro; and Nahara, Akira, 4,551,778, Cl. 360-131.000.
Ikeda, Tadashi; Kuwabara, Kenichi; Yamamuro, Kiyohiko; and Kokubo, Tadayoshi, 4,551,424, Cl. 430-588.000.
Ishibashi, Teruhiko, 4,551,053, Cl. 414-114.000.
Koyama, Koichi; Noguchi, Yasuhiro; and Toriuchi, Masaharu, 4,551,423, Cl. 430-559.000.
Nakauchi, Kenji, 4,551,023, Cl. 356-444.000.
Ogawa, Masashi; Nakamura, Taku; Urata, Yukihide; and Yamauchi, Shingo, 4,551,412, Cl. 430-265.000.
Sugimoto, Naohiko; and Kojima, Tetsuro, 4,551,420, Cl. 430-505.000.
Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, 4,551,419, Cl. 430-445.000.
Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, 4,551,421, Cl. 430-509.000.
Takahashi, Yoshiteru; and Ogawa, Masataka, 4,551,645, Cl. 310-46.000.
Tomiyama, Hideki; and Satake, Masaki, 4,551,410, Cl. 430-215.000.
Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, 4,551,386, Cl. 428-323.000.
Fuji Xerox Co., Ltd.: *See*—
Aoki, Matsuyuki; and Tanaka, Shuji, 4,551,002, Cl. 355-3.0DD.
Kurata, Masami, 4,551,750, Cl. 358-75.000.
Satoh, Masato, 4,551,769, Cl. 358-296.000.
Fujii, Yasuhiko; Owaki, Isao; Saito, Susumu; Mori, Takaro; and Nakamura, Shinji, to Victor Company of Japan, Limited. Digital data duplication apparatus. 4,551,840, Cl. 371-38.000.
Fujimoto, Hiroshi: *See*—
Sakamoto, Junichi; Fujimoto, Hiroshi; and Miyake, Hideo, 4,551,215, Cl. 204-159.230.
Fujirebio Kabushiki Kaisha: *See*—
Sugiyama, Masami; Shibuya, Hiroko; and Kasahara, Yasushi, 4,551,272, Cl. 260-112.50R.

Fujita, Kouichi; and Shirato, Moritoshi, to Fujitsu Limited. One-chip semiconductor device incorporating a power-supply-potential detecting circuit with reset function. 4,551,841, Cl. 371-66.000.

Fujita, Masahiro; and Uemura, Yukio, to Maeda Metal Industries Ltd.; and Nissan Motor Co., Ltd. Power tightening device having detachable socket unit. 4,550,633, Cl. 81-56.000.

Fujitsu Limited: *See—*
Fujita, Kouichi; and Shirato, Moritoshi, 4,551,841, Cl. 371-66.000.
Nishimori, Eiji; Tsuchiya, Chikara; and Sano, Yoshiaki, 4,551,644, Cl. 307-573.000.
Takahashi, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, 4,551,634, Cl. 307-243.000.
Takeda, Hirofumi; and Suzuki, Hirokazu, 4,551,639, Cl. 307-455.000.
Takemae, Yoshihiro; and Kabashima, Katsuhiko, 4,551,822, Cl. 365-222.000.
Tanji, Shigeo; and Wakatsuki, Noboru, 4,551,695, Cl. 333-195.000.
Watanabe, Hisashi, 4,551,745, Cl. 357-72.000.

Fujiwara, Michiaki; and Ikeda, Toshiharu, to Murata Kikai Kabushiki Kaisha. Yarn end sucking and holding device in winder. 4,550,886, Cl. 242-35.60E.

Fukada, Koichi; and Sugimoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Abnormal noise detector for use in the inspection of gear units. 4,550,603, Cl. 73-587.000.

Fukada, Koichi: *See—*
Sugimoto, Hiroshi; and Fukada, Koichi, 4,550,604, Cl. 73-587.000.

Fukuda, Tadaji: *See—*
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,551,405, Cl. 430-64.000.

Fukuda, Yoshiaki: *See—*
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.

Fukumoto, Hiroshi: *See—*
Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, 4,551,497, Cl. 524-423.000.

Fukuyama, Toshifumi; and Okamoto, Kiyohide, to Omron Tateisi Electronics Co. Dual electronic switching device with reduced external terminals. 4,551,640, Cl. 307-471.000.

Fuller, Robert A.: *See—*
Morris, Jeffrey D.; and Fuller, Robert A., 4,551,309, Cl. 422-135.000.
Morris, Jeffrey D.; and Fuller, Robert A., 4,551,510, Cl. 526-68.000.

Funato, Masatomi: *See—*
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,551,403, Cl. 430-58.000.

Furio, Martino: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, 4,551,451, Cl. 514-217.000.

Furnier -u. Sperrholzwerk: *See—*
Traumuller, Otfried; and Weinberg, Gerd, 4,550,832, Cl. 206-509.000.
Traumuller, Otfried; and Weinberg, Gerd, 4,550,847, Cl. 220-4.00F.

Furuhara, Hiroshi: *See—*
Koizumi, Satoru; Furuhara, Hiroshi; and Teshima, Daisuke, 4,551,775, Cl. 360-74.100.

Furuhashi, Hiroyuki: *See—*
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; and Ueno, Hiroshi, 4,551,440, Cl. 502-119.000.

Fushimi, Kazuo; Tsunakawa, Hirokazu; and Yonahara, Kunio, to Kabushiki Kaisha Meidensha. Electrically conductive plastic complex material. 4,551,267, Cl. 252-511.000.

G. D. Searle & Co.: *See—*
Mueller, Richard A.; and Partis, Richard A., 4,551,279, Cl. 260-404.000.

G.E.M.M. Manufacturing: *See—*
Henderson, George H., 4,550,739, Cl. 131-247.000.

Gabriele, Louis: *See—*
Melillo, Anthony; and Gabriele, Louis, 4,550,907, Cl. 272-93.000.

Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, to Rhone-Poulenc Specialites Chimiques. Sizing composition and method of making same and use thereof for sizing textile yarns. 4,551,382, Cl. 428-258.000.

Gailey, Edward D.: *See—*
Hall, William E.; Gailey, Edward D.; and Ovanin, George J., 4,550,922, Cl. 279-119.000.

Gaither, John L., to Caslin, Richard L. Plastic sheet tubing, bag-forming apparatus for lawn mowers. 4,550,553, Cl. 56-202.000.

Gale, Ronald J., to Ford Motor Company. Clutch wear indicator. 4,550,815, Cl. 192-30.00W.

Galvan, Paul A.: *See—*
Douglass, Randle; Jacquin, H. George; Chewey, Paul M.; Galvan, Paul A.; and Naragon, Richard S., 4,550,888, Cl. 244-3.220.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Instep support for footwear. 4,550,511, Cl. 36-50.000.

Gandolfi, Carmelo: *See—*
Faustini, Franco; Passarotti, Carlo; Ceserani, Roberto; and Gandolfi, Carmelo, 4,551,476, Cl. 514-461.000.

Gange, Robert A., to RCA Corporation. Line cathode heater and support structure for a flat panel display device. 4,551,648, Cl. 313-37.000.

Gannett, Joel W., to AT&T Bell Laboratories. Self-testing digital circuits. 4,551,838, Cl. 371-25.000.

Gardner, Robert W.; Guile, Donald L.; and Lynn, Merrill, to Corning Glass Works. Process for mixing and extruding ceramic materials. 4,551,295, Cl. 264-177.00R.

Garel-Jones, Philip M.: *See—*
Vella, Paul J.; Garel-Jones, Philip M.; and Lowe, Richard S., 4,551,019, Cl. 356-73.100.

Garrett, Ernest R.; and Chambers, Charles A., to Garrett, Ernest R. Container top opening means. 4,550,851, Cl. 220-277.000.

Gas Research Institute: *See—*
Griffiths, James C., 4,550,711, Cl. 126-391.000.

Gass, Karl: *See—*
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,551,531, Cl. 544-320.000.

Gateway Industries, Inc.: *See—*
Doty, Gerald A.; and Hunter, William E., Jr., 4,550,474, Cl. 24-633.000.

Gaulin, Camille A.; and Katzman, Howard A., to Aerospace Corporation, The. Enhanced carbon fiber combustion using a catalyst. 4,551,487, Cl. 523-215.000.

Geary, Alan P., to Rolls-Royce Limited. Device for passing a fluid flow through a barrier. 4,551,062, Cl. 415-115.000.

Geiger, Cletus M. Variable displacement sliding vane pump/hydraulic motor. 4,551,080, Cl. 418-28.000.

Geiger, Daniel D.: *See—*
Anders, James V.; Anderson, Thomas W.; Geiger, Daniel D.; and Turnpaugh, George F., 4,551,670, Cl. 323-281.000.

Gellman, Gary; Erburt, George A.; and Roe, James E., to Nabisco Brands, Inc. Canine biscuit containing discrete meat and/or meat by-product particles and method for making same. 4,551,343, Cl. 426-549.000.

Genentech, Inc.: *See—*
DeBoer, Herman A., 4,551,433, Cl. 435-253.000.

General Electric Company: *See—*
Bianchi, Julio J., 4,551,621, Cl. 235-117.00R.
Carnes, Ronald C.; and Naumann, Ted F., Jr., 4,550,608, Cl. 73-633.000.
Day, Robert A., 4,551,647, Cl. 310-335.000.
Herberg, Michael J.; Macander, Rudolph F.; and Stegman, Todd R., 4,551,515, Cl. 528-18.000.
Johnson, Curtis A.; Renlund, Gary M.; Van Buren, Charles E.; and Prochazka, Svante, 4,551,436, Cl. 501-90.000.
Lohmeijer, Johannes H. G. M., 4,551,494, Cl. 524-89.000.
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,017, Cl. 356-28.500.
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,018, Cl. 356-28.500.
Miller, Gary; Jobes, Sam S.; and Benfey, David P., 4,551,657, Cl. 315-399.000.
Payne, Thomas R., 4,551,618, Cl. 219-510.000.
Renlund, Gary M.; and Johnson, Curtis A., 4,551,496, Cl. 524-322.000.
Riederer, Stephen J.; and Keyes, Gary S., 4,551,800, Cl. 364-414.000.
Talley, John J., 4,551,563, Cl. 568-804.000.

General Electric Company, p.l.c., The: *See—*
Hilsum, Cyril, 4,551,653, Cl. 315-10.000.

General Foods Corporation: *See—*
Davidescu, Reghina; de Ceglie, Gaetano J.; Jacquett, Harold W.; and Paluzzi, Joseph A., 4,551,345, Cl. 426-594.000.
El-Hag, Nabil A.; Cochran, Stuart A.; Schwabe, Kenneth R.; Carricato, Louis; and Shanbhag, Sudhakar P., 4,551,340, Cl. 426-437.000.
Jasovsky, George A.; Jacquett, Harold W.; and de Ceglie, Gaetano J., 4,551,344, Cl. 426-594.000.

General Motors Corporation: *See—*
Drouillard, James R., 4,550,529, Cl. 49-348.000.
Stahura, Daniel W.; and Richey, Daniel D., 4,551,630, Cl. 290-38.00R.
Teerman, Richard F.; Bosch, Russell H.; and Wirth, Ricky C., 4,550,875, Cl. 239-88.000.

General Signal Corporation: *See—*
Wiese, John R.; and Walsh, Thomas J., 4,550,620, Cl. 73-864.550.

Gentric, Alain. Connector. 4,550,971, Cl. 339-99.00R.

Genus, Inc.: *See—*
Mahawili, Imad, 4,550,684, Cl. 118-724.000.

Georg Fischer Aktiengesellschaft: *See—*
Fischer, Kurt; and Muller, Franz, 4,550,765, Cl. 164-194.000.

Georg Wagner KG: *See—*
Lorenz, Jurgen W., 4,551,311, Cl. 422-300.000.

Gery, Daniel E.: *See—*
Fraignier, Bernard; and Gery, Daniel E., 4,550,617, Cl. 73-862.040.

Gesell, Elmer G.: *See—*
West, James C.; and Gesell, Elmer G., 4,550,762, Cl. 164-98.000.

Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and Rogers, Charles J., to Alcan International Limited. Electrolytic reduction cells. 4,551,218, Cl. 204-240.000.

GFM Gesellschaft Fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H.: *See—*
Kirchberger, Peter, 4,551,043, Cl. 407-43.000.

Ghebrid, Faycal: *See—*
Marshall, Lloyd B.; and Ghebrid, Faycal, 4,550,935, Cl. 285-18.000.

Ghelardoni, Mario: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, 4,551,451, Cl. 514-217.000.

Giammarese, Victor P. Remote control apparatus for audio systems. 4,551,714, Cl. 340-825.720.

Gibbon, Robert M.: *See*—
Diehl, Larry F., Jr.; and Gibbon, Robert M., 4,551,293, Cl. 264-150.000.

Gidge, Kenneth N.; and Richard, Henry J., to BSL Corporation. Transparent access curtain for coolers and the like. 4,550,760, Cl. 160-328.000.

Gilbert, Barry K.; and Schwab, Daniel J., to Mayo Foundation. Leadless chip carrier apparatus providing an improved transmission line environment and improved heat dissipation. 4,551,746, Cl. 357-74.000.

Gilbert, Barry K.; and Schwab, Daniel J., to Mayo Foundation. Leadless chip carrier apparatus providing for a transmission line environment and improved heat dissipation. 4,551,747, Cl. 357-74.000.

Giles, Alan F., to Precision Engineering Products Limited (Suffolk). Method and apparatus for checking the weight of a moving article. 4,550,793, Cl. 177-145.000.

Gillette Company, The: *See*—
Baker, Hugh W. B.; and White, Robert, 4,551,035, Cl. 401-104.000.
Baker, Hugh W. B.; and Whiting, Graham J., 4,551,038, Cl. 401-265.000.

Gilmore, Mark R., to Copeland Corporation. Integral oil pressure sensor. 4,551,069, Cl. 417-13.000.

Ginther, George E., Sr.: *See*—
Johnson, A. David, Jr.; Bachman, Joseph L., Jr.; Ginther, George E., Sr.; Zimmermann, Charles E.; and Johnson, Albert D., Sr., 4,551,126, Cl. 493-453.000.

Giolitti, Alessandro: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, 4,551,451, Cl. 514-217.000.

Girardeau, Yvette: *See*—
Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, 4,551,382, Cl. 428-258.000.

Gist-Brocades N.V.: *See*—
van Leusen, Albert M.; and van Leusen, Adriaan M., 4,551,278, Cl. 260-397.400.

Glacier Products: *See*—
Ames, Theodore; and Brown, Vernon E., Jr., 4,551,025, Cl. 366-144.000.

Gladish, Herbert E., to E. B. Eddy Forest Products, Ltd. Air film supported endless belt conveyor system. 4,550,823, Cl. 198-805.000.

Glanville, Roger: *See*—
Cox, Anthony F.; Glanville, Roger; Lloyd, Owen; and Robbins, Keith V., 4,550,591, Cl. 73-28.000.

Godlewski, Edward S. Stock feeding machine. 4,550,902, Cl. 271-10.000.

Goebel, Joseph A. Rodent trap. 4,550,524, Cl. 43-75.000.

Goegelein, Gerald W.; Longmore, Paul H.; and Fisher, Stan E., to International Telephone & Telegraph Corp. High speed operational recurring signature evaluator for digital equipment tester. 4,551,837, Cl. 371-25.000.

Goehler, Robert F.: *See*—
La Bonte, David E.; Richter, Kurt W.; and Goehler, Robert F., 4,550,622, Cl. 74-87.000.

Goel, Anil B., to Ashland Oil, Inc. Maleic anhydride/styrene copolymerization controlled with oxazolines. 4,551,511, Cl. 526-204.000.

Goemans, Hermanus I., to Xerox Corporation. Overlay devices. 4,551,015, Cl. 355-75.000.

Goff, David L.: *See*—
Fryd, Michael; and Goff, David L., 4,551,522, Cl. 528-351.000.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Toy track presenting interference to passage of toy vehicles thereon. 4,550,910, Cl. 273-86.00B.

Goldstein, Norman P.; and Lane, Stephen A., to Westinghouse Electric Corp. Radiation monitoring apparatus. 4,551,298, Cl. 376-245.000.

Goldstein, Richard M.; Caro, Edward R.; and Wu, Chialin, to United States of America, National Aeronautics and Space Administration. Method and apparatus for contour mapping using synthetic aperture radar. 4,551,724, Cl. 343-5.0CM.

Goldstein, Vladimir. Ice making machine and method. 4,551,159, Cl. 62-541.000.

Good, Jack E., to Larsen, Grant; and Larsen, Marian, a part interest to each. Display system. 4,550,839, Cl. 211-189.000.

Goodman, Alvin M.: *See*—
Russell, John P.; and Goodman, Alvin M., 4,551,643, Cl. 307-570.000.

Goodman, Joseph J.: *See*—
Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., 4,551,533, Cl. 546-35.000.

Goodrum, Richard W.: *See*—
Raley, Garland E.; and Goodrum, Richard W., 4,550,546, Cl. 53-425.000.

Goodyear Tire & Rubber Company, The: *See*—
Breedyk, Frans N.; and van Gelderen, Guido, 4,550,598, Cl. 73-146.000.
Eisenzimmer, George W., 4,550,587, Cl. 72-402.000.
Hinkel, Walter W., 4,550,756, Cl. 152-209.00R.
Lal, Joginder; and Senyek, Michael L., 4,551,503, Cl. 525-332.100.
Smith, Richard R.; and Wilson, John R., 4,551,368, Cl. 428-35.000.
Watts, George T.; and Thaden, Theron J., 4,550,827, Cl. 206-304.000.

Goossen, Levi H. Tickler system wherein an item of data in card file is readily accessible by either of two criteria, such as date and subject matter. 4,550,934, Cl. 283-37.000.

Gordon, Michael E.: *See*—
Cohen, Lenard; and Gordon, Michael E., 4,551,783, Cl. 361-223.000.

Gordon, Reuben H.: *See*—
Bykerk, Rocky S., 4,551,781, Cl. 361-143.000.

Gorman, William G.; and Byron, David A., to Sterling Drug Inc. Syringe for extrusion of semi-plastic material. 4,551,135, Cl. 604-82.000.

Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.

Goshima, Takayuki: *See*—
Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, 4,550,638, Cl. 84-431.000.

Gosney, John J.: *See*—
Capper, Peter; and Gosney, John J., 4,551,196, Cl. 156-616.00R.

Gosselink, Eugene P., to Procter & Gamble Company, The. Cationic polymers having clay soil removal/anti-redeposition properties useful in detergent compositions. 4,551,506, Cl. 525-417.000.

Goto, Tokuju: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,550,578, Cl. 68-5.00E.

Gotthard, George, to American Cyanamid Company. Treatment of substantially metallic ion free acrylamide and related compounds. 4,551,266, Cl. 252-400.00R.

Gough, Peter R. Cleaning elongate strip by die impaction. 4,551,180, Cl. 134-9.000.

Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Surface mountable coefficient of expansion matching connector. 4,550,959, Cl. 339-9.00E.

Graber, Helen E. Incontinent care pad method and apparatus. 4,551,144, Cl. 604-378.000.

Grabher, Erich; Muller, Max; Wetzel, Horst; and Schultschik, Robert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Pretensioning element for circulation track bearing member for linear bearings. 4,550,955, Cl. 308-6.00C.

Graham, Anne M.: *See*—
Pesa, Frederick A.; and Graham, Anne M., 4,551,442, Cl. 502-178.000.

Graham, John F., to Burroughs Corporation. Self-braking ribbon transport apparatus. 4,550,885, Cl. 242-204.000.

Grant, Graham C. Fluid flowmeter. 4,550,615, Cl. 73-861.210.

Grantz, Helmut: *See*—
Andres, Rudolf; Grantz, Helmut; Muenzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,550,774, Cl. 165-104.210.

Grapha - Holding AG: *See*—
Boss, Heinz, 4,550,883, Cl. 242-59.000.

Grati, Giorgio, to OGRAD s.r.l. Blank article for assembling into a container having double or box-like walls, and an openable hinge wall. 4,550,853, Cl. 220-416.000.

Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, to U.S. Philips Corporation. Process for spreading the volume of traffic over different control channels of a cellular radio transmission system. 4,551,852, Cl. 455-33.000.

Grayzel, Joseph. Device for analysis of recorded electrocardiogram. 4,550,502, Cl. 33-1.00B.

Green, James A., II: *See*—
Young, Donald C.; and Green, James A., II, 4,551,167, Cl. 71-64.100.

Green, Mickey: *See*—
Vitale, Vincent J., 4,551,103, Cl. 434-225.000.

Greenberg, Lawrence J.: *See*—
Hyman, Gregory E.; and Greenberg, Lawrence J., 4,551,114, Cl. 446-397.000.

Greenspan, George, to American Home Products Corporation. Stimulation of antigen production by *Bordetella pertussis*. 4,551,429, Cl. 435-68.000.

Greenwood-Smith, Robin, to Mount Isa Mines Limited. Lead-in-air monitor. 4,551,848, Cl. 378-045.000.

Grenthe, Bo, to N.Y. Patent Development Corp. Method for removing oil from water with an absorbent. 4,551,253, Cl. 210-680.000.

Gresch, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,551,304, Cl. 422-4.000.

Griffith, Carl D.: *See*—
Clark, Thomas R.; and Griffith, Carl D., 4,551,804, Cl. 364-434.000.

Griffiths, James C., to Gas Research Institute. Pulse combustion deep fat fryer. 4,550,711, Cl. 126-391.000.

Gross, Kimnaja: *See*—
Mehra-Palta, Asha; and Gross, Kimnaja, 4,550,528, Cl. 47-58.000.

Grossi, Anthony V.; Hahn, Louis T.; and Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Additives for hot mix asphalt. 4,551,178, Cl. 106-273.00N.

Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Stabilized solutions of hydroxylamine or its salts in water or alcohols, and their preparation. 4,551,318, Cl. 423-265.000.

Grossman, Barry G.: *See*—
Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., 4,551,829, Cl. 370-3.000.

Grossman, Jack J., to McDonnell Douglas Corporation. Radiation dispersing cavities. 4,551,628, Cl. 250-503.100.

Gruber, George E., to Ludlow Industries, Inc. Level control device. 4,551,663, Cl. 318-482.000.

GTE Automatic Electric Incorporated: *See*—
Daniels, William R.; and Young, John S., 4,551,585, Cl. 179-175.30R.
Parikh, Kamal I., 4,551,836, Cl. 371-1.000.

Guala, Piergiacomo, to Angelo Guala S.p.A. Bottle closure. 4,550,845, Cl. 215-252.000.

Guenthner, Russell W.: *See*—
Ryan, Charles P.; and Guenthner, Russell W., 4,551,799, Cl. 364-200.000.

Guerin, Yves: *See*—
Antognini, Luciano; and Guerin, Yves, 4,551,665, Cl. 318-696.000.

Guidevaux, Jacques, to Thomson CSF. Coaxial microwave load isolator of the three-plate type including such a load and use of such an isolator. 4,551,693, Cl. 333-22.00R.

Guile, Donald L.: *See*—
Gardner, Robert W.; Guile, Donald L.; and Lynn, Merrill, 4,551,295, Cl. 264-177.00R.

Guilmette, Joseph G.; and Wright, Robert C. Method and apparatus for the recovery and recycling of condensable gas reactants. 4,551,197, Cl. 156-642.000.

Gulla, Michael; Taylor, Paul; and Oddi, Michael J., to Shipley Company Inc. Photoresist composition of cocondensed naphthol and phenol with formaldehyde in admixture with positive o-quinone diazide or negative azide. 4,551,409, Cl. 430-192.000.

Gurr, George P.; and Matheson, Frederick A., to Cyborex Laboratories, Inc. Energy controller and method for dynamic allocation of priorities of controlled load curtailment to ensure adequate load sharing. 4,551,812, Cl. 364-492.000.

Gusev, Vladimir I.: *See*—
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.

Gustafson, Harry A.: *See*—
Callaghan, Stephen P.; Callaghan, Timothy J.; Gustafson, Harry A.; and Lim, Wah L., 4,551,021, Cl. 356-350.000.

Guttinger, Hannes: *See*—
Troup, Alan P.; Guttinger, Hannes; and Pfister, Gustav, 4,551,710, Cl. 340-505.000.

Gysling, Peter, to Hewlett Packard Company. Motorized cable mechanism for positioning tractors in a printer. 4,550,623, Cl. 74-89.200.

Haarmann, Walter: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,551,464, Cl. 514-312.000.

Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,550,655, Cl. 99-450.400.

Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Apparatus for making wafer blocks. 4,550,655, Cl. 99-450.400.

Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,550,655, Cl. 99-450.400.

Hack, Joachim: *See*—
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.

Hacker, John R.: *See*—
Snetting, Mark; West, Dan; and Hacker, John R., 4,550,919, Cl. 277-23.000.

Hadley, Russell F.; and Kovacs, Carl W. Active probe. 4,551,672, Cl. 324-133.000.

Haeber, John A.; Rains, John K.; Beitler, Brad D.; and Kukuchek, George S., to Vetco Offshore, Inc. Marine riser coupling assembly. 4,550,936, Cl. 285-26.000.

Haeno, Akira: *See*—
Aizawa, Koki; and Haeno, Akira, 4,551,642, Cl. 307-552.000.

Haettinger, George C.: *See*—
Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, 4,550,471, Cl. 17-1.00R.

Hafner, Edmund W., to UOP Inc. Constitutive producer of a thermostable glucose isomerase. 4,551,430, Cl. 435-94.000.

Hafner, Klaus. Rimless spectacles. 4,550,989, Cl. 351-103.000.

Hagedorn, Stanley R.; and Roach, Stewart W., to Marco Seattle, Inc. Transfer system for fish and similar articles. 4,551,042, Cl. 406-93.000.

Hahn, Louis T.: *See*—
Grossi, Anthony V.; Hahn, Louis T.; and Marzocchi, Alfred, 4,551,178, Cl. 106-273.00N.

Hajdu, Istvan: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.

Hajos, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.

Hakamata, Kensaku: *See*—
Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, 4,550,638, Cl. 84-431.000.

Hakim, Carlos A.: *See*—
Hakim, Salomon; and Hakim, Carlos A., 4,551,128, Cl. 604-9.000.

Hakim, Salomon; and Hakim, Carlos A. Cerebrospinal fluid shunt valve. 4,551,128, Cl. 604-9.000.

Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil M., 4,551,560, Cl. 568-465.000.

Hall, Charles B., to Outboard Marine Corporation. Marine propulsion device with tilt and trim means with fluid filtering. 4,551,105, Cl. 440-61.000.

Hall, Harvey. Mining machine with adjustable hood-scoop assembly. 4,550,952, Cl. 299-64.000.

Hall, Timothy J.; and Tridgell, Eric J., to National Research Development Corporation. Method and material for improving the growth of plants. 4,550,527, Cl. 47-58.000.

Hall, William E.; Gailey, Edward D.; and Ovanin, George J., to S-P Manufacturing Corporation, The. Workholder. 4,550,922, Cl. 279-119.000.

Halliburton Company: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; and Penn, Jack C., 4,551,766, Cl. 358-256.000.

Halpern, Yuval; and Mott, Donna, to Borg-Warner Chemicals, Inc. Salts of 5,5-bis-(bromomethyl)-2-hydroxy-2-oxo-1,3,2-dioxaphosphorinane and process for preparing same. 4,551,527, Cl. 544-214.000.

Hamada, Makoto; Hasegawa, Junji; and Oosaka, Kuniaki, to Toyota Jidosha Kabushiki Kaisha. Reinforced side door support structure. 4,550,948, Cl. 296-202.000.

Hamilton, Lawrence E.; and Rutili, Renzo N., to Stewart-Warner Corporation. Illuminated membrane switch. 4,551,598, Cl. 200-314.000.

Hanahan, Donald J.; and Pinckard, R. Neal, to Board of Regents, The University of Texas System. Use of synthetic phosphoglycerides possessing platelet activating properties as desensitizing agents. 4,551,446, Cl. 514-77.000.

Handi-Pac, Inc.: *See*—
Klawitter, Ronald R., 4,550,503, Cl. 33-18.00R.

Hanemaayer, Jacobus N. Van layout. 4,550,946, Cl. 296-156.000.

Hanisch, Horst, to Dynamit Nobel Aktiengesellschaft. Organosilane esters having glycol ether moieties. 4,551,541, Cl. 549-215.000.

Hansen, Charles C., III. Valve-strainer housings and assemblies. 4,550,896, Cl. 251-84.000.

Hansen, Frits U.; and Jensen, Ove, to Kosan Teknova A/S. Regulator for mounting on the outlet connection of a gas cylinder or like container. 4,550,746, Cl. 137-461.000.

Hansen, Hans-Jurgen; and Pfoertner, Karlheinz, to Hoffmann-La Roche Inc. Photochemical preparation of previtamin D. 4,551,214, Cl. 204-159.000.

Hansen, Loren F., to Outboard Marine Corporation. Self-propelled aerating device. 4,550,783, Cl. 172-21.000.

Hanson, Donald L.: *See*—
Amdahl, Gene M.; Hanson, Donald L.; Kreuzenstein, Ronald K.; Roshon-Larsen, Gwynne L.; and Woffinden, Gary A., 4,551,797, Cl. 364-200.000.

Hanson, Steven P., to Marvin Glass & Associates. Malleable material vehicle playset. 4,551,109, Cl. 446-95.000.

Hara, Kunihiko: *See*—
Itoh, Hiroyasu; Suzuki, Yasutoshi; Horiuchi, Yasuhiro; and Hara, Kunihiko, 4,551,669, Cl. 323-268.000.

Harada, Masato; Miya, Shinya; Yamada, Sadahiko; and Iijima, Makoto, to Chisso Corporation. Solid catalyst component for olefin polymerization and process for producing same. 4,551,439, Cl. 502-107.000.

Harari, Sami: *See*—
Botrel, Jose ; Harari, Sami; Briere, Joseph; and Louvel, Bernard, 4,551,839, Cl. 371-35.000.

Harder, Benjamin P.; and Harder, Willard J. Side rear view mirror cleaning system. 4,550,988, Cl. 350-584.000.

Harder, Willard J.: *See*—
Harder, Benjamin P.; and Harder, Willard J., 4,550,988, Cl. 350-584.000.

Harkness, John C.: *See*—
Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., 4,551,187, Cl. 148-411.000.

Harley-Davidson Motor Co., Inc.: *See*—
Konneker, Reinhard, 4,550,698, Cl. 123-195.0AC.

Harms, Engelbert G.; Schmeitz, Axel W.; and Thomaschewski, Hubertus P., to Uniroyal Englebert Reifen GmbH. Method of treating unvulcanized elastomeric objects. 4,551,362, Cl. 427-180.000.

Harris Corporation: *See*—
Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., 4,551,829, Cl. 370-3.000.

Harris, Joan; and Michel, Thomas J., to Harris, Joan. Oral medicament lollipop. 4,551,329, Cl. 424-22.000.

Harrison, Thomas S., to Sterling Drug Inc. Moist tissue soft pack dispensers. 4,550,855, Cl. 221-63.000.

Harry, Alan J., to Frankl & Kirchner GmbH & Co. KG Fabrik fur Elektromotoren u. elektrische Apparate. Electromagnetic clutch-brake for industrial sewing machine. 4,550,814, Cl. 192-18.00B.

Harter, Robert R., to Werkzeugmaschinenfabrik Oerlikon-Buehrle AG. Missile canister restraint device. 4,550,640, Cl. 89-1.806.

Hartmann, Horst: *See*—
Bott, Kaspar; Kaibel, Gerd; Hartmann, Horst; Irnich, Rudolf; and Buelow, Horst, 4,551,208, Cl. 203-60.000.

Hase, Takashi: *See*—
Yaguchi, Masachika; Mikami, Tomoki; and Hase, Takashi, 4,551,397, Cl. 428-691.000.

Hasegawa, Junji: *See*—
Hamada, Makoto; Hasegawa, Junji; and Oosaka, Kuniaki, 4,550,948, Cl. 296-202.000.
Hashimoto, Shinichi: *See*—
Nakatomi, Yoshisugu; Uchida, Kohachi; and Hashimoto, Shinichi, 4,551,014, Cl. 355-75.000.
Hashimoto, Susumu: *See*—
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, 4,551,757, Cl. 358-212.000.
Hasselmann, Heinz: *See*—
Bitsch, Harald; Donner, Klaus; Hasselmann, Heinz; and Horbach, Rainer, 4,550,664, Cl. 105-180.000.
Hata, Yoshitada: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.
Hatanaka, Takao: *See*—
Nagatani, Toshio; Chiba, Norio; Hatanaka, Takao; and Saito, Toshio, 4,551,367, Cl. 428-35.000.
Hattori, Takeshi: *See*—
Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, 4,550,638, Cl. 84-431.000.
Hauni-Werke Korber & Co. Kg.: *See*—
Kasparek, Alois; and Burger, Jurgen, 4,551,040, Cl. 406-28.000.
Haupt, Heinrich: *See*—
Brassat, Bert; Buysch, Hans-Josef; Hermann, Karl H.; and Haupt, Heinrich, 4,551,495, Cl. 524-94.000.
Havelick, Linn D.: *See*—
Beckstead, Leo W.; Havelick, Linn D.; and Hogsett, Robert F., 4,551,314, Cl. 423-54.000.
Hawkins, James B.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,550,657, Cl. 100-43.000.
Hayakawa, Masanori; Yamada, Noriaki; Kawamoto, Hiromi; and Nishimura, Satoshi, to Central Glass Company Limited. Wet process of preparing fine particles of ferrite of magnetoplumbite structure. 4,551,260, Cl. 252-62.590.
Hayashi, Kenji: *See*—
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.
Hayashi, Kiyoshi, to Mita Industrial Co., Ltd. Light deflector. 4,550,985, Cl. 350-6.300.
Hayashi, Mitsuji: *See*—
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, 4,551,592, Cl. 200-67.00D.
Hayashi, Satoru: *See*—
Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, 4,550,638, Cl. 84-431.000.
Hayden, Martin P. Lure having bait storage compartment. 4,550,521, Cl. 43-41.000.
Haylock, John C.; and Vanderkooi, Nicholas, Jr., to Allied Corporation. Polyester composition containing tertiary and quaternary amine carboxylate salts. 4,551,507, Cl. 525-437.000.
Haynes, Joel, to Mindlin, Richard B. Batch-brewing coffee system. 4,550,651, Cl. 99-279.000.
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, to Hitachi, Ltd. Bearing device of sealed type scroll compressor. 4,551,082, Cl. 418-55.000.
Hazeyama, Takeshi: *See*—
Beppu, Masaru; Agawa, Setsuo; Hazeyama, Takeshi; and Nashimoto, Toshiyuki, 4,551,240, Cl. 209-143.000.
Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Chemicals, Inc. Substituted 2,5-dimethylpyrroles. 4,551,539, Cl. 548-412.000.
Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Chemicals, Inc. Substituted 2,5-dimethylpyrroles. 4,551,540, Cl. 548-531.000.
Heckert, David C.: *See*—
Nakel, Gunther M.; and Heckert, David C., 4,551,342, Cl. 426-548.000.
Heden-Team A.G.: *See*—
Hedenberg, Gunnar, 4,550,653, Cl. 99-348.000.
Hedenberg, Gunnar, 4,550,654, Cl. 99-348.000.
Hedenberg, Gunnar, to Heden-Team A.G. Apparatus for making food products. 4,550,653, Cl. 99-348.000.
Hedenberg, Gunnar, to Heden Team A.G. Apparatus for automatic preparation of food products such as bread, cakes and the like. 4,550,654, Cl. 99-348.000.
Hefner, Werner: *See*—
Wagner, Eckhart; Volkamer, Klaus; Hefner, Werner; and Wagner, Ulrich, 4,551,158, Cl. 55-46.000.
Heiland, Wolfgang K., to United States of America, Agriculture. Hide transfer apparatus. 4,550,905, Cl. 271-202.000.
Heimrich, Klaus: *See*—
Bottcher, Hugo; Heimrich, Klaus; Hildebrandt, Gustav; Kracke, Heinrich; and Richter, Johannes, 4,551,297, Cl. 264-224.000.
Heiz, Hans, to Heiz, Therese. Process for producing an antireflecting layer on viewing screens. 4,551,356, Cl. 427-64.000.
Heiz, Therese: *See*—
Heiz, Hans, 4,551,356, Cl. 427-64.000.
Helene Curtis Industries, Inc.: *See*—
Wagman, Julius; and Sajic, Branko, 4,551,330, Cl. 424-59.000.
Helix Technology Corporation: *See*—
Bertsch, Peter K., 4,550,571, Cl. 62-6.000.
Hellgren, Lars G. I.: *See*—
Engstrom, Nils M. L., 4,550,594, Cl. 73-61.10C.
Henderson, Doug: *See*—
Josselson, Marc; and Henderson, Doug, 4,550,636, Cl. 83-743.000.
Henderson, George H., to G.E.M.M. Manufacturing. Pipe tamping tool. 4,550,739, Cl. 131-247.000.
Henkel KGaA: *See*—
Herold, Julius; Kluth, Hermann; Meffert, Alfred; and Leder, Manfred, 4,551,517, Cl. 528-60.000.
Henkel Kommandelgesellschaft auf Aktien: *See*—
Strack, Hans; Roebke, Wolfgang; Kneitel, Dieter; and Parr, Ehrfried, 4,551,322, Cl. 423-329.000.
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, to U.S. Philips Corporation. Non-linear resistor and method of manufacturing the same. 4,551,269, Cl. 252-520.000.
Henny Penny Corporation: *See*—
Reese, Vernon E.; and Schwierking, Roger A., 4,550,677, Cl. 118-31.000.
Henry, Michael: *See*—
Ramsden, Hugh E.; and Henry, Michael, 4,551,245, Cl. 210-198.200.
Hensley, Albert L., Jr.: *See*—
Miller, Jeffrey T.; and Hensley, Albert L., Jr., 4,551,572, Cl. 585-454.000.
Henthorn, Jules B.: *See*—
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., 4,551,719, Cl. 340-825.360.
Heochst Aktiengesellschaft: *See*—
Wottka, Bernhard; and Weindl, Alfred, 4,551,294, Cl. 264-175.000.
Hepworth, Malcolm T.: *See*—
Sabacky, Bruce J.; and Hepworth, Malcolm T., 4,551,313, Cl. 423-59.000.
Herberg, Michael J.; Macander, Rudolph F.; and Stegman, Todd R., to General Electric Company. Process for the continuous manufacture of silicone gums. 4,551,515, Cl. 528-18.000.
Herbert, William B.; and Patel, Rohit A. Surgical drainage and irrigation apparatus for post operative patient care. 4,551,130, Cl. 604-32.000.
Herman, Jack. Insert type footwear. 4,550,446, Cl. 2-239.000.
Herman Miller, Inc.: *See*—
Wiersema, Delbert; and Szmadzinski, John A., 4,550,893, Cl. 248-222.400.
Hermann, Karl H.: *See*—
Brassat, Bert; Buysch, Hans-Josef; Hermann, Karl H.; and Haupt, Heinrich, 4,551,495, Cl. 524-94.000.
Herold, Julius; Kluth, Hermann; Meffert, Alfred; and Leder, Manfred, to Henkel KGaA. Two-component polyurethane adhesive. 4,551,517, Cl. 528-60.000.
Herzl, Peter J., to Fischer & Porter Company. Oscillatory flowmeter. 4,550,614, Cl. 73-861.190.
Hettinger, William P., Jr., to Ashland Oil, Inc. Reclaiming lube oil in MRS unit. 4,551,234, Cl. 208-179.000.
Hewlett Packard Company: *See*—
Gysling, Peter, 4,550,623, Cl. 74-89.200.
Heys, George; and Coon, Dennis R., to NCR Corporation. Apparatus for testing printed circuit boards. 4,551,675, Cl. 324-158.00F.
Hi-Stat Manufacturing Company, Inc.: *See*—
Hire, Charles J., 4,551,702, Cl. 337-347.000.
Hibar Systems Limited: *See*—
Barall, Heinz, 4,551,072, Cl. 417-318.000.
Hibbard, George A.; and Morrison, Ward D., to Consolidated Technologies Corporation. Hammer. 4,550,785, Cl. 173-134.000.
Hicks, Hamilton. Fire-retardant polyurethane foam containing finely ground dry fire-retardant particles containing a volatile active fire-retardant componet. 4,551,483, Cl. 521-103.000.
Hicks, John W., Jr., to Polaroid Corporation. Hollow tube method for forming an optical fiber. 4,551,162, Cl. 65-4.200.
Higashiguchi, Toshiaki; and Sonoda, Michiaki, to Nippon Electric Co., Ltd. Stationary-picture transmission system. 4,551,767, Cl. 358-257.000.
Higashiguti, Teruaki: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,551,403, Cl. 430-58.000.
Higuchi, Shigemitsu: *See*—
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.
Hikari Industry Co., Ltd: *See*—
Inoue, Junichi, 4,551,244, Cl. 210-198.100.
Hilboll, Gerd; Doppelfeld, Ille-Stephanie; and Prop, Gerrit, to A. Nattermann & Cie GmbH. Method of treating high blood pressure using 6-[4-(1-imidazolyl)-phenyl]-5-methyl-3-oxo-tetrahydropyridazines. 4,551,455, Cl. 514-252.000.
Hildebrandt, Gustav: *See*—
Bottcher, Hugo; Heimrich, Klaus; Hildebrandt, Gustav; Kracke, Heinrich; and Richter, Johannes, 4,551,297, Cl. 264-224.000.
Hill, Michael R. H.: *See*—
Lane, Edward S.; and Hill, Michael R. H., 4,551,358, Cl. 427-126.600.

Hillenbrand, Gary F.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,551,407, Cl. 430-138.000.
Hilsum, Cyril, to General Electric Company, p.l.c., The. Production of correction signals in a color CRT system. 4,551,653, Cl. 315-10.000.
Hilton-Davis Chemical Co., The: *See*—
Hung, William M., 4,551,740, Cl. 346-218.000.
Hinkel, Walter W., to Goodyear Tire & Rubber Company, The. Pneumatic tire tread. 4,550,756, Cl. 152-209.00R.
Hintzen, Franz-Josef: *See*—
Trage, Burghard; Hintzen, Franz-Josef; and Leitz, Richard, 4,550,570, Cl. 60-693.000.
Hirabayashi, Toshiyasu: *See*—
Horie, Motonobu; Hirabayashi, Toshiyasu; and Suzuki, Hisao, 4,550,821, Cl. 198-416.000.
Hiraga, Masaharu, to Sanden Corporation. Scroll-type fluid displacement apparatus with angular offset varying means. 4,551,078, Cl. 418-16.000.
Hiraga, Masaharu: *See*—
Sato, Tadashi; and Hiraga, Masaharu, 4,551,081, Cl. 418-55.000.
Hirai, Kazuo: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Hirai, Kazuo; Miyasaka, Kingo; and Izumi, Masayoshi, 4,551,393, Cl. 428-609.000.
Hirai, Koichi: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,551,565, Cl. 568-864.000.
Hirai, Koji: *See*—
Matsumoto, Mitsuo; Hirai, Koji; Yoshimura, Noriaki; and Okamura, Takayuki, 4,551,518, Cl. 528-80.000.
Hirai, Yoshihiko, to Nippon Electric Co., Ltd. All-solid-state display including an organic electrochromic layer with ion donor/acceptor. 4,550,982, Cl. 350-357.000.
Hirai, Yukio: *See*—
Miyagawa, Junichi; and Hirai, Yukio, 4,551,600, Cl. 219-10.49R.
Hirai, Yutaka: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,551,405, Cl. 430-64.000.
Hiramatsu, Seiichiro: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichiro; Ohtsuka, Mitsugi; and Maeno, Tsuyoshi, 4,551,722, Cl. 340-904.000.
Hiramoto, Masao: *See*—
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, 4,551,757, Cl. 358-212.000.
Hirao, Katsumi; and Sasaki, Akira, to Toyo Aerosol Industry Co., Ltd.; and Kanpe Katei Toryoo Kabushiki Kaisha. Obliquely-handling nozzle for aerosol. 4,550,865, Cl. 222-402.210.
Hirata, Sadao: *See*—
Maruhashi, Yoshitsugu; and Hirata, Sadao, 4,551,366, Cl. 428-35.000.
Hire, Charles J., to Hi-Stat Manufacturing Company, Inc. Thermostatic switch and method of manufacture. 4,551,702, Cl. 337-347.000.
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, to Canon Kabushiki Kaisha; and Copyer Kabushiki Kaisha. Disazo electrophotographic photosensitive member. 4,551,404, Cl. 430-59.000.
Hirobe, Junichi: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.
Hironaka, Yoshio; and Kumazawa, Takashi, to Idemitsu Kosan Company Limited. Process for the production of carbonyl compounds. 4,551,555, Cl. 568-401.000.
Hirsch, Martin: *See*—
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.
Hisajima, Masahiko: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, 4,551,009, Cl. 355-15.000.
Hisao, Tanaka: *See*—
Takayuki, Okada; Hisao, Tanaka; Ken-Ichi, Sawara; and Tsutomu, Konaka, 4,551,509, Cl. 526-68.000.
Hitachi, Ltd.: *See*—
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, 4,551,082, Cl. 418-55.000.
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.
Isa, Hitoshi; Kaneko, Ryoichi; and Kashiwahara, Katsuto, 4,550,569, Cl. 60-657.000.
Matsuura, Hiromi, 4,551,820, Cl. 365-189.000.
Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, 4,550,705, Cl. 123-488.000.
Noda, Tamotsu; Tamura, Hifumi; and Okano, Hiroshi, 4,551,650, Cl. 313-362.100.
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.
Suzuki, Kensuke, 4,551,744, Cl. 357-64.000.
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.
Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, 4,550,480, Cl. 29-156.40R.
Watanabe, Ryuji; Ando, Hisashi; Kuniya, Keiichi; and Kurosawa, Yukio, 4,551,596, Cl. 200-144.00B.
Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, 4,550,612, Cl. 73-727.000.
Hitachi Microcomputer Engineering, Ltd.: *See*—
Matsuura, Hiromi, 4,551,820, Cl. 365-189.000.
Hitchcock, Gary L.: *See*—
Kraft, Derald H.; and Hitchcock, Gary L., 4,551,122, Cl. 474-170.000.
Hochuli, Erich, to Hoffmann-La Roche Inc. Purification of interferon by metal chelate chromatography. 4,551,271, Cl. 260-112.00R.
Hodges, Michael J.; and Scanes, Malcolm K., to Detexomat Machinery Ltd. Method and apparatus for transferring hosiery between hosiery manufacturing machines. 4,550,868, Cl. 223-43.000.
Hodgson, Darel E.: *See*—
Krumme, John F.; and Hodgson, Darel E., 4,550,870, Cl. 227-19.000.
Hoechst Aktiengesellschaft: *See*—
Schaedlich, Gunther; and Moraw, Roland, 4,551,406, Cl. 430-119.000.
Stuhler, Herbert, 4,551,561, Cl. 568-619.000.
Hoechst-Roussel Pharmaceuticals Incorporated: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,551,474, Cl. 514-309.000.
Hofbauer, Edwin; Lechner, Peter; and Exler, Heribert, to Voest-Alpine Aktiengesellschaft. Apparatus for charging a rotary kiln with pneumatic tires. 4,551,051, Cl. 414-21.000.
Hoffman-Lewis, Ltd.: *See*—
Hoffman, Paul H., 4,550,706, Cl. 123-549.000.
Hoffman, Paul H., to Hoffman-Lewis, Ltd. Fuel vaporizer. 4,550,706, Cl. 123-549.000.
Hoffmann-La Roche Inc.: *See*—
Hansen, Hans-Jurgen; and Pfoertner, Karlheinz, 4,551,214, Cl. 204-159.000.
Hochuli, Erich, 4,551,271, Cl. 260-112.00R.
Petrzilka, Martin; Schadt, Martin; and Villiger, Alois, 4,550,981, Cl. 350-350.00R.
Tilley, Jefferson W., 4,551,460, Cl. 514-267.000.
Hoffmann, Ralph M., to Trochoid Power Corporation. Dual rotor gear assembly for trochoidal rotary device. 4,551,083, Cl. 418-61.00A.
Hogsett, Robert F.: *See*—
Beckstead, Leo W.; Havelick, Linn D.; and Hogsett, Robert F., 4,551,314, Cl. 423-54.000.
Hoheisel, Peter; and Bartholmei, Peter, to Continental Gummi-Werke Aktiengesellschaft. Variable-volume receptacle, especially for use as a compensating receptacle in building heating systems. 4,550,833, Cl. 206-527.000.
Hohman, John E., to Sexton-Espec, Inc. Refrigeration system with liquid bypass line. 4,550,574, Cl. 62-197.000.
Hokanson, Gerard C.: *See*—
Kern, Donald L.; Hokanson, Gerard C.; and French, James C., 4,551,529, Cl. 544-265.000.
Hoke, Merle C.; Armstrong, Richard G.; and Penn, James E., to Manville Service Corp. Exterior post top mounting lighting fixture. 4,551,792, Cl. 362-362.000.
Holik, Herbert; and Kurtz, Rudiger, to Sulzer Brothers Ltd. Headbox for a papermaking machine. 4,551,204, Cl. 162-336.000.
Holley, David M., to Power Components Inc. Pneumatic spring. 4,550,899, Cl. 267-119.000.
Holliday, Robert A. Coin handling apparatus for use in merchandise vending machines. 4,550,818, Cl. 194-1.00D.
Holmberg Company, The: *See*—
Holmberg, Thomas A., 4,551,374, Cl. 428-43.000.
Holmberg, Thomas A., to Holmberg Company, The. Continuous sheet with perforated tear-off driving edge and recessed reinforced inner edge. 4,551,374, Cl. 428-43.000.
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, to Holter, Heinz. Method of cleaning air loaded with pollutants. 4,551,304, Cl. 422-4.000.
Holzman, James W.: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,550,956, Cl. 312-250.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asaka, Urataro; Kanai, Shigeo; Tanaka, Yasuhiro; and Iwamoto, Kazuya, 4,551,074, Cl. 417-366.000.
Inoue, Kazuo; and Otsuka, Tsuneo, 4,550,794, Cl. 180-219.000.
Katoh, Tadashi, 4,551,594, Cl. 200-82.00R.
Kawaguchi, Takeshi, 4,550,809, Cl. 188-18.00A.
Numata, Morikuni; and Nakadate, Toshihiko, 4,551,605, Cl. 219-86.310.
Okubo, Takeshi; Kodachi, Hideo; and Miyanaka, Masaki, 4,550,488, Cl. 29-568.000.
Honeywell Inc.: *See*—
Anderson, Robert D., 4,551,705, Cl. 340-347.0DA.
Betsch, Regis J.; Liu, Michael S.; and Tufte, Obert N., 4,551,394, Cl. 428-641.000.
Callaghan, Stephen P.; Callaghan, Timothy J.; Gustafson, Harry A.; and Lim, Wah L., 4,551,021, Cl. 356-350.000.
Kozlik, Tony J., 4,551,721, Cl. 340-825.520.
Mott, Richard C., 4,550,616, Cl. 73-861.740.

Honeywell Information Systems Inc.: *See*—
Ryan, Charles P.; and Guenthner, Russell W., 4,551,799, Cl. 364-200.000.
Hong, Kuochih: *See*—
Sapru, Krishna; Hong, Kuochih; Fetcenko, Michael A.; and Venkatesan, Srinivasan, 4,551,400, Cl. 429-94.000.
Honma, Ichiro; Koyama, Arata; Amano, Masatoshi; and Takumi, Nobusuke, to Ishihara Sangyo Kaishi, Limited. Process for producing cobalt-and ferrous iron-containing ferromagnetic iron oxides. 4,551,327, Cl. 423-594.000.
Hope, Douglas A.: *See*—
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., 4,551,184, Cl. 148-127.000.
Horbach, Rainer: *See*—
Bitsch, Harald; Donner, Klaus; Hasselmann, Heinz; and Horbach, Rainer, 4,550,664, Cl. 105-180.000.
Horiba, Ltd.: *See*—
Uematsu, Hiroaki; and Aoki, Junji, 4,551,222, Cl. 204-417.000.
Horicke, Bernhard: *See*—
Tamm, Franz; Horicke, Bernhard; Welfle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, 4,551,183, Cl. 148-12.00R.
Horie, Motonobu; Hirabayashi, Toshiyasu; and Suzuki, Hisao, to Japan Tobacco & Salt Public Corporation, The. Cigarette reversing apparatus. 4,550,821, Cl. 198-416.000.
Horiuchi, Yasuhiro: *See*—
Itoh, Hiroyasu; Suzuki, Yasutoshi; Horiuchi, Yasuhiro; and Hara, Kunihiko, 4,551,669, Cl. 323-268.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Amides from dialkylenetriamines and lubricant and fuel compositions containing same. 4,551,257, Cl. 252-32.70E.
Horton, Robert A.; and Jayaraman, Gowri S., to TRW Inc. Apparatus and method for casting single crystal articles. 4,550,764, Cl. 164-122.200.
Horvath, Carlos F., to Burroughs Corporation. Multiple control stores in a pipelined microcontroller for handling nester subroutines. 4,551,798, Cl. 364-200.000.
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, to Nissan Motor Company, Limited. Electronic engine control system for controlling the energy conversion process of an internal combustion engine. 4,551,803, Cl. 364-431.050.
Hoshino, Kazuo; Tanaka, Teruo; and Ito, Kenjiro, to Nisshin Steel Company, Ltd. Process for preparing strips or sheets of high strength austenitic steel having improved fatigue strength. 4,550,487, Cl. 29-527.700.
Hosomizu, Hiroshi: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.
Howell, Bobby A.; and Walles, Erik W. Macromolecular complexes of amidocarbonylic water-soluble polymers and square platinous and equivalent organometallics. 4,551,502, Cl. 525-326.900.
Hower, Larry: *See*—
Runyon, Wayne; and Hower, Larry, 4,550,728, Cl. 128-303.180.
Hower, Philip L.; and Li, Eric K., to Unitrode Corporation. Method for reducing leakage currents in semiconductor devices. 4,551,353, Cl. 427-39.000.
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, to Takeda Chemical Industries, Ltd. Ethylene glycol derivatives having antiprotozoan, anti-fungal and anti-tumor activity. 4,551,532, Cl. 546-22.000.
Hsich, Henry S. Y.; and Ambrose, Richard J., to Lord Corporation. Cure-control method for thermosetting polymeric material. 4,551,807, Cl. 364-473.000.
Hsu, Chao-Yang; and Ellis, Paul E., Jr., to Sun Refining and Marketing Company. Hydroformylation catalyst and process. 4,551,559, Cl. 568-454.000.
Hubbard, George R. Universal plumbing pipe locator and support. 4,550,451, Cl. 4-192.000.
Huber, William B.: *See*—
Slavik, William H.; and Huber, William B., 4,551,134, Cl. 604-67.000.
Hudson, Henry C., to Shell Oil Company. Catalysts for the selective hydrogenation of acetylenes. 4,551,443, Cl. 502-313.000.
Huey, Cecil O., Jr.: *See*—
Fletcher, George R., Jr.; Messick, George H., Jr.; Roby, Charles K.; and Huey, Cecil O., Jr., 4,550,532, Cl. 51-288.000.
Huffer, Wolfgang: *See*—
Brinkwerth, Wolfgang; Huffer, Wolfgang; Raue, Roderich; Schieder, Rudolf; and Telle, Helmut, 4,551,265, Cl. 252-301.170.
Huffman, Charles E., to Rockwell International Corporation. Apparatus for providing loopback of signals where the signals being looped back have an overhead data format which is incompatible with a high speed intermediate carrier overhead format. 4,551,830, Cl. 370-15.000.
Hufnagel, Robert E., to Perkin-Elmer Corporation, The. Achromatic holographic optical system. 4,550,973, Cl. 350-3.720.
Hughes, Robert W.; and Cantrel, James F., to Ingersoll-Rand Company. Threaded engagement means. 4,551,050, Cl. 411-436.000.
Hughes Tool Company: *See*—
Berg, Gunnar H., 4,550,942, Cl. 294-102.200.
Hult, Anders; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., to International Business Machines Corporation. Process for preparing negative relief images with cationic photopolymerization. 4,551,418, Cl. 430-325.000.
Hung, Chi-wen: *See*—
Imai, Tamotsu; and Hung, Chi-wen, 4,551,574, Cl. 585-660.000.
Hung, William M., to Hilton-Davis Chemical Co., The. Electrochromic and marking systems. 4,551,740, Cl. 346-218.000.
Hunt, David J., to International Computers Limited. Apparatus for decoding run-length encoded data. 4,551,706, Cl. 340-347.0DD.
Hunter, William E., Jr.: *See*—
Doty, Gerald A.; and Hunter, William E., Jr., 4,550,474, Cl. 24-633.000.
Hurlemann, Ernst: *See*—
Bruderer, Werner; Brieger, Hans; and Hurlemann, Ernst, 4,550,641, Cl. 89-12.000.
Husslein, Gerd: *See*—
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,551,448, Cl. 514-130.000.
Hutzenlaub, Armin S. P.; and Duppengiesser, Dieter, to Erwin Kampf GmbH & Co. Maschinenfabrik. Reel cutting and winding machine. 4,550,882, Cl. 242-56.600.
Hyatt, Gilbert P. Filter display system. 4,551,816, Cl. 364-724.000.
Hydril Company: *See*—
Mott, James D., 4,550,780, Cl. 166-323.000.
Hyman, Frederic E. Method and apparatus for opposing deformity, displacement, and expulsion of the ocular tissues during open eye surgery. 4,550,713, Cl. 128-1.00R.
Hyman, Gregory E.; and Greenberg, Lawrence J. Impact-activated toy. 4,551,114, Cl. 446-397.000.
I.P.E. Nuova Bialetti S.p.A.: *See*—
Cristante, Guido, 4,551,026, Cl. 366-149.000.
Iai, Kenichiro, to Yoshida Kogyo K.K. Apparatus for forming and planting slide fastener elements. 4,550,477, Cl. 29-33.200.
IBU Betten-Union GmbH & Co. KG: *See*—
Endel, Dieter; and Billerbeck, Gerd, 4,550,459, Cl. 5-437.000.
Idemitsu Kosan Company Limited: *See*—
Hironaka, Yoshio; and Kumazawa, Takashi, 4,551,555, Cl. 568-401.000.
Ikeda, Makoto; and Nakamura, Akira, 4,551,258, Cl. 252-32.70E.
IFM Electronic GmbH: *See*—
Buck, Robert; and Lamarche, Jean L., 4,551,637, Cl. 307-308.000.
Igarashi, Keiichi: *See*—
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, 4,551,478, Cl. 514-603.000.
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, to Nippon Soken, Inc. Piezoelectric hydraulic control valve. 4,550,744, Cl. 137-80.000.
Igawa, Tatsuya: *See*—
Sato, Morio; and Igawa, Tatsuya, 4,550,660, Cl. 101-128.210.
Igelbuscher, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,551,304, Cl. 422-4.000.
Iida, Hideo, to Nissan Motor Co., Ltd. Weft picking system of loom and method for operating same. 4,550,754, Cl. 139-452.000.
Iida, Shinobu: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, 4,551,386, Cl. 428-323.000.
Iijima, Makoto: *See*—
Harada, Masato; Miya, Shinya; Yamada, Sadahiko; and Iijima, Makoto, 4,551,439, Cl. 502-107.000.
Iizima, Kazuo: *See*—
Sato, Masanori; and Iizima, Kazuo, 4,551,375, Cl. 428-57.000.
Iizima, Takeshi: *See*—
Mino, Hisashi; and Iizima, Takeshi, 4,551,408, Cl. 430-141.000.
Iizuka, Eiichi; Sando, Tomoji; Kashima, Shinji; and Maki, Masakazu, to Showa Denko Kabushiki Kaisha. Method for growing boron nitride crystals of cubic system. 4,551,195, Cl. 156-603.000.
Iizuka, Eiichi, to Showa Denko Kabushiki Kaisha. Process for producing boron nitride of cubic system. 4,551,316, Cl. 423-290.000.
Ikeda, Hideo: *See*—
Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, 4,551,419, Cl. 430-445.000.
Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, 4,551,421, Cl. 430-509.000.
Ikeda, Makoto; and Nakamura, Akira, to Idemitsu Kosan Company Limited. Grease composition. 4,551,258, Cl. 252-32.70E.
Ikeda, Masafumi: *See*—
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,173, Cl. 75-12.000.
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,174, Cl. 75-12.000.
Ikeda, Masuhiro: *See*—
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.
Ikeda, Tadashi; Kuwabara, Kenichi; Yamamuro, Kiyohiko; and Kokubo, Tadayoshi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,551,424, Cl. 430-588.000.
Ikeda, Takashi: *See*—
Otake, Katsumasa; Ikeda, Takashi; Omura, Takashi; and Imada, Kunihiko, 4,551,150, Cl. 8-496.000.
Ikeda, Toshiharu: *See*—
Fujiwara, Michiaki; and Ikeda, Toshiharu, 4,550,886, Cl. 242-55.60E.
Iketani, Ryuichi: *See*—
Yokouchi, Hiroshi; and Iketani, Ryuichi, 4,551,321, Cl. 365-203.000.

Ikezawa, Harumi: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,551,565, Cl. 568-864.000.

Illinois Tool Works Inc.: *See*—
Folson, Henry J., 4,550,808, Cl. 188-1.120.
Peterson, Francis C., 4,551,189, Cl. 156-73.500.

Im, Darryl. Bicycle type exercise apparatus with indexing pedal cranks. 4,550,906, Cl. 272-73.000.

Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, to Hitachi, Ltd.; and Shin-Etsu Chemical Co., Ltd. Continuous vacuum treating apparatus. 4,551,310, Cl. 422-186.050.

Imada, Kunihiko: *See*—
Otake, Katsumasa; Ikeda, Takashi; Omura, Takashi; and Imada, Kunihiko, 4,551,150, Cl. 8-496.000.

Imada, Nobuyuki; and Okada, Toshiteru, to Mitsui Mining & Smelting Co., Ltd. Macroporous manganese dioxide water purifier. 4,551,254, Cl. 210-688.000.

Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; and Ueno, Hiroshi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,551,440, Cl. 502-119.000.

Imai, Tamotsu; and Hung, Chi-wen, to UOP Inc. Indium-containing dehydrogenation catalyst. 4,551,574, Cl. 585-660.000.

Imaizumi, Yutaka: *See*—
Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, 4,550,480, Cl. 29-156.40R.

Immunicon, Inc.: *See*—
Liberti, Paul A.; and Pollara, Paul, 4,551,435, Cl. 436-541.000.

Imperial Chemical Industries PLC: *See*—
Crosby, John, 4,551,281, Cl. 260-465.00D.
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,551,469, Cl. 514-383.000.
Punja, Nazim, 4,551,546, Cl. 560-124.000.

Ina, Toshikazu: *See*—
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,550,618, Cl. 73-862.340.

Inaba, Masahito: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Kawagoe, Nobukazu; Naruse, Kazuhiko; and Inaba, Masahito, 4,551,011, Cl. 355-35.000.

Inagaki, Hiromichi. Water-proof paper container and its manufacturing method. 4,551,123, Cl. 493-108.000.

Inakagata, Satoru: *See*—
Wada, Sumio; and Inakagata, Satoru, 4,551,666, Cl. 320-20.000.

Inco Limited: *See*—
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., 4,551,184, Cl. 148-127.000.

Indalex, Division of Indal Limited: *See*—
Degen, Max F., 4,550,584, Cl. 72-273.000.

Industrial Parts Depot: *See*—
Rasmussen, Robert, 4,550,513, Cl. 37-141.00R.

Industrial Refuse Sales, Inc.: *See*—
Adsit, Gordon H., 4,550,849, Cl. 220-71.000.

Ingersoll-Rand Company: *See*—
Hughes, Robert W.; and Cantrel, James F., 4,551,050, Cl. 411-436.000.
La Bonte, David E.; Richter, Kurt W.; and Goehler, Robert F., 4,550,622, Cl. 74-87.000.

Ingraham, Glenn J.: *See*—
Darrow, Russell E.; Ingraham, Glenn J.; Larnerd, John D.; and Nesky, Robert W., 4,550,493, Cl. 29-739.000.

Ingre, Lars P., to Telefonaktiebolaget LM Ericsson. Method of manufacturing a structure with a fixed and a movable part provided with optical fibres. 4,550,483, Cl. 29-416.000.

Ingvason, Sigurdur. Hull construction for seagoing vesaels. 4,550,673, Cl. 114-56.000.

Inman, Roger, to Archant Limited. Knife sharpener. 4,550,632, Cl. 76-86.000.

Inmont Corporation: *See*—
Panush, Sol, 4,551,491, Cl. 524-31.000.

Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Optical data pattern generation device comprising phosphor member. 4,551,737, Cl. 346-161.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, 4,551,602, Cl. 219-69.00D.
Inoue, Kiyoshi, 4,551,606, Cl. 219-121.0EA.

Inoue, Junichi, to Hikari Industry Co., Ltd. Spilled oil processing catamaran. 4,551,244, Cl. 210-198.100.

Inoue, Kazuo; and Otsuka, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle having an engine with a supercharger. 4,550,794, Cl. 180-219.000.

Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, to Inoue-Japax Research Incorporated. Electrical machining using an aqueous solution with a recycled surface active agent. 4,551,602, Cl. 219-69.00D.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Beamed energy radiation control method and apparatus. 4,551,606, Cl. 219-121.0EA.

Inoue, Masao; and Suzuki, Shingo, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,550,977, Cl. 350-128.000.

Inoue, Tetsuhiko. Coating film having adhesiveness. 4,551,381, Cl. 428-240.000.

Inoue, Toru: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.

Inskip, Ervin B., to Mallinckrodt, Inc. Preparation of bis(aminophenyl) ethers from (N-acetyl)aminophenols or their phenolates. 4,551,551, Cl. 564-430.000.

Institut Pasteur: *See*—
Danos, Olivier; Katinka, Michael; and Yaniv, Moshe, 4,551,270, Cl. 260-112.50R.

Institute po Metaloznanie I Technologia na Metalite: *See*—
Nikolov, Ivan D., 4,550,763, Cl. 164-119.000.

Integrated Ionics, Inc.: *See*—
Lauks, Imants R., 4,551,209, Cl. 204-1.00T.

International Business Machines Corporation: *See*—
Anderson, Carl J., 4,551,704, Cl. 340-347.0AD.
Annunziata, Eugene J.; and Stammely, Thomas E., 4,551,671, Cl. 324-51.000.
Benaadon, Joseph M.; and Brickman, Norman F., 4,551,835, Cl. 370-110.100.
Chappell, Barbara A.; Chappell, Terry I.; and Woodall, Jerry M., 4,550,489, Cl. 29-571.000.
Darrow, Russell E.; Ingraham, Glenn J.; Larnerd, John D.; and Nesky, Robert W., 4,550,493, Cl. 29-739.000.
Di Milia, Vincent; Maldonado, Juan R.; Speidell, James L.; and Warlaumont, John M., 4,551,192, Cl. 156-345.000.
Hult, Anders; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,551,418, Cl. 430-325.000.
Roalson, Howard J., 4,551,776, Cl. 360-77.000.
Schettler, Helmut; and Stadler, Ewald, 4,551,789, Cl. 361-406.000.

International Computers Limited: *See*—
Hunt, David J., 4,551,706, Cl. 340-347.0DD.

International Hydron Corporation: *See*—
Rawlings, David L., 4,551,086, Cl. 425-425.000.

International Paper Company: *See*—
Asanuma, Mari, 4,550,826, Cl. 206-259.000.
Mehra-Palta, Asha; and Gross, Kimnaja, 4,550,528, Cl. 47-58.000.

International Resources Management, Inc.: *See*—
Coffing, Samuel F., 4,551,246, Cl. 210-221.200.

International Standard Electric Corporation: *See*—
Cranfield, Brain A.; Fothergill, John C.; and Wolfe, Susan V., 4,551,499, Cl. 524-487.000.
Mattle, Hans P., 4,551,748, Cl. 358-10.000.
Rose, Jochen, 4,551,587, Cl. 200-11.00R.
Schemmel, Gerald; and Linnebach, Richard, 4,551,186, Cl. 148-171.000.

International Technidyne Corp.: *See*—
Mintz, Michael D., 4,551,308, Cl. 422-58.000.

International Telephone & Telegraph Corp.: *See*—
Goegelein, Gerald W.; Longmore, Paul H.; and Fisher, Stan E., 4,551,837, Cl. 371-25.000.
Murphy, Kent A., 4,550,974, Cl. 350-96.150.
Nelson, Randall B., 4,551,305, Cl. 422-5.000.

Internationale Octrooi Maatscappij "Octropa" B.V.: *See*—
Van Dijk, Cornelis; and De Jongh, Rudolph O., 4,551,441, Cl. 502-159.000.

Intevep, S.A.: *See*—
Calderon, Jose L.; and Betancourt, Humberto, 4,551,232, Cl. 208-92.000.

Irie, Yoichiro: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.

Irnich, Rudolf: *See*—
Bott, Kaspar; Kaibel, Gerd; Hartmann, Horst; Irnich, Rudolf; and Buelow, Horst, 4,551,208, Cl. 203-60.000.

Irvine Sensors Corporation: *See*—
Carson, John C.; and Clark, Stewart A., 4,551,629, Cl. 250-578.000.

Isa, Hitoshi; Kaneko, Ryoichi; and Kashiwahara, Katsuto, to Hitachi, Ltd. Main steam inlet structure for steam turbine. 4,550,569, Cl. 60-657.000.

Isakov, Edmund, to Kennametal Inc. Two-prong rotary bit, especially for use with roof drills, and insert therefor. 4,550,791, Cl. 175-410.000.

Ishibashi, Teruhiko, to Fuji Photo Film Co. Ltd. Sheet sub-stack separating and feeding apparatus. 4,551,053, Cl. 414-114.000.

Ishida, Hiroshi; and Taniguchi, Mitsuyuki, to Fanuc Ltd. Motor speed detecting device. 4,551,662, Cl. 318-316.000.

Ishida, Hiroshi: *See*—
Amemiya, Yoichi; Ishida, Hiroshi; Takekoshi, Yashitaka; and Ushiyama, Shigeyuki, 4,551,676, Cl. 324-208.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,550,578, Cl. 68-5.00E.

Ishigami, Sumiyuki; and Sato, Mitsuru, to Tokyo Denpa Kabushiki Kaisha; and Kabushiki Kaisha Goto Seisakusho. Quartz unit. 4,550,475, Cl. 29-25.350.

Ishihara Sangyo Kaishi, Limited: *See*—
Honma, Ichiro; Koyama, Arata; Amano, Masatoshi; and Takumi, Nobusuke, 4,551,327, Cl. 423-594.000.

Ishihara, Shunichi: *See*—
Ito, Michio; Kitajima, Nobuo; Kasai, Masanao; and Ishihara, Shunichi, 4,551,003, Cl. 355-3.00R.

Ishikawa, Kiyotsugu: *See*—
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, 4,551,757, Cl. 358-212.000.

Ishikawa, Masatoshi, to Director General of Agency of Industrial Science and Technology. Device for detecting center position of two-dimensionally distributed data. 4,551,817, Cl. 364-811.000.
Ishikawa, Norio: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,550,993, Cl. 354-402.000.
Ishikawa, Shozo: *See*—
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, 4,551,404, Cl. 430-59.000.
Ishikawa, Takehiro; Yamazawa, Akira; and Kusumoto, Yasuo, to Kabushiki Kaisha Daini Seikosha. Electronic clinical thermometer. 4,551,031, Cl. 374-117.000.
Ishizaka, Sunao; and Maida, Osamu, to Nippon Kogaku K.K. Device for detecting code on film cartridge. 4,550,991, Cl. 354-21.000.
Ito, Hiroshi: *See*—
Hult, Anders; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,551,418, Cl. 430-325.000.
Ito, Kenjiro: *See*—
Hoshino, Kazuo; Tanaka, Teruo; and Ito, Kenjiro, 4,550,487, Cl. 29-527.700.
Ito, Michio; Kitajima, Nobuo; Kasai, Masanao; and Ishihara, Shunichi, to Canon Kabushiki Kaisha. Electrophotographic process and apparatus therefor. 4,551,003, Cl. 355-3.00R.
Ito, Toshimichi: *See*—
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, 4,551,571, Cl. 585-440.000.
Ito, Yoichiro: *See*—
Kolobow, Theodor; and Ito, Yoichiro, 4,551,251, Cl. 210-635.000.
Itoh, Hiroyasu; Suzuki, Yasutoshi; Horiuchi, Yasuhiro; and Hara, Kunihiko, to Nippondenso Co., Ltd. Packaged solar cell apparatus. 4,551,669, Cl. 323-268.000.
ITT Corporation: *See*—
Winter, David F.; and Dick, William K., 4,551,633, Cl. 307-147.000.
ITT Industries, Inc.: *See*—
Blossfeld, Lothar, 4,550,490, Cl. 29-571.000.
Deutscher, Hans-Christian; Kohler, Alfred; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,550,469, Cl. 15-250.340.
Schaefer, Ernst-Dieter, 4,550,567, Cl. 60-562.000.
Iwakura, Tomoatsu: *See*—
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, 4,551,571, Cl. 585-440.000.
Iwamoto, Kazuya: *See*—
Asaka, Urataro; Kanai, Shigeo; Tanaka, Yasuhiro; and Iwamoto, Kazuya, 4,551,074, Cl. 417-366.000.
Iwao, Noriyuki: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Sekiguchi, Koichi; Takematsu, Hikaru; Yamamoto, Kazuyuki; and Kubo, Teruyuki, 4,551,583, Cl. 179-99.00M.
Iwashita, Takashi; Atsumi, Shinya; and Nakahama, Ryoji, to Sanshin Kogyo Kabushiki Kaisha. Tilt lock mechanism for marine propulsion device. 4,551,104, Cl. 440-56.000.
Izraeli, Hyman, to Thomas & Betts Corporation. Connector assembly for insulated cable. 4,550,965, Cl. 339-47.00R.
Izumi, Masayoshi: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Hirai, Kazuo; Miyasaka, Kingo; and Izumi, Masayoshi, 4,551,393, Cl. 428-609.000.
J. C. & D Enterprises, Inc.: *See*—
Union, Elias J., 4,550,904, Cl. 271-198.000.
J. D. Phillips Corporation: *See*—
Phillips, James D.; and Sheets, Robert L., 4,551,048, Cl. 409-197.000.
J. F. Werz Jr. KG Werzalit-Pressholzwerk: *See*—
Traumuller, Otfried; and Weinberg, Gerd, 4,550,832, Cl. 206-509.000.
Traumuller, Otfried; and Weinberg, Gerd, 4,550,847, Cl. 220-4.00F.
J. H. Benecke GmbH: *See*—
Bottcher, Hugo; Heimrich, Klaus; Hildebrandt, Gustav; Kracke, Heinrich; and Richter, Johannes, 4,551,297, Cl. 264-224.000.
J & R Manufacturing, Inc.: *See*—
Riley, Roy C., 4,550,966, Cl. 339-84.000.
J. T. Baker Chemical Co.: *See*—
Ramsden, Hugh E.; and Henry, Michael, 4,551,245, Cl. 210-198.200.
J. T. Eaton & Company, Inc.: *See*—
Baker, Stanley Z.; Baker, Bart M.; and Baker, Benjamin H., 4,550,525, Cl. 43-131.000.
J. Wagner GmbH: *See*—
Kille, Ewald; and Karliner, Rudolf, 4,551,037, Cl. 401-146.000.
Jackson, Denise M.: *See*—
Tsuda, Yoshihisa; and Jackson, Denise M., 4,551,432, Cl. 435-232.000.
Jackson, Michael A., to Envirotech Corporation. Flotation machine and aeration impeller. 4,551,285, Cl. 261-87.000.
Jackson, Winston J., Jr.: *See*—
Morris, John C.; and Jackson, Winston J., Jr., 4,551,520, Cl. 528-302.000.
Jacob, Karl A. Apparatus for operating a high pressure boiler. 4,550,687, Cl. 122-1.00C.
Jacoby, George V.: *See*—
Cohn, Martin; Jacoby, George V.; and Vinding, Jorgen P., 4,551,773, Cl. 360-40.000.
Jacquett, Harold W.: *See*—
Davidescu, Reghina; de Ceglie, Gaetano J.; Jacquett, Harold W.; and Paluzzi, Joseph A., 4,551,345, Cl. 426-594.000.
Jasovsky, George A.; Jacquett, Harold W.; and de Ceglie, Gaetano J., 4,551,344, Cl. 426-594.000.
Jacquin, H. George: *See*—
Douglass, Randle; Jacquin, H. George; Chewey, Paul M.; Galvan, Paul A.; and Naragon, Richard S., 4,550,888, Cl. 244-3.220.
Jagenberg AG: *See*—
Schonmeier, Herbert, 4,550,887, Cl. 242-56.300.
Jamak, Inc.: *See*—
Diehl, Larry F., Jr.; and Gibbon, Robert M., 4,551,293, Cl. 264-150.000.
James, William A.: *See*—
Cook, John R.; and James, William A., 4,551,143, Cl. 604-371.000.
Janssen, Kermit W.: *See*—
Sullivan, Dale W.; Janssen, Kermit W.; and Mitchell, Andrew, 4,550,778, Cl. 166-234.000.
Janusis, Charles: *See*—
Rowen, John B.; Rowen, Christopher M.; and Janusis, Charles, 4,551,028, Cl. 368-204.000.
Japan Tobacco & Salt Public Corporation, The: *See*—
Horie, Motonobu; Hirabayashi, Toshiyasu; and Suzuki, Hisao, 4,550,821, Cl. 198-416.000.
Jasovsky, George A.; Jacquett, Harold W.; and de Ceglie, Gaetano J., to General Foods Corporation. Method for aromatizing soluble coffee. 4,551,344, Cl. 426-594.000.
Jayant, Nuggehally S.: *See*—
Cox, Richard V.; and Jayant, Nuggehally S., 4,551,580, Cl. 179-1.50S.
Jayaraman, Gowri S.: *See*—
Horton, Robert A.; and Jayaraman, Gowri S., 4,550,764, Cl. 164-122.200.
Jeno's, Inc.: *See*—
Schmit, Justin M.; and Luoma, Eugene H., 4,551,337, Cl. 426-94.000.
Jensen, Laurel H.: *See*—
Lundahl, E. Cordell; Wiser, James G.; Thornley, W. Ray; and Jensen, Laurel H., 4,550,554, Cl. 56-294.000.
Jensen, Ove: *See*—
Hansen, Frits U.; and Jensen, Ove, 4,550,746, Cl. 137-461.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Arendt, Paul N.; and Valencia, Vance I., 4,551,844, Cl. 373-12.000.
Jobes, Sam S.: *See*—
Miller, Gary; Jobes, Sam S.; and Benfey, David P., 4,551,657, Cl. 315-399.000.
Johnson, A. David, Jr.; Bachman, Joseph L., Jr.; Ginther, George E., Sr.; Zimmermann, Charles E.; and Johnson, Albert D., Sr., to Wayne Automation Corp. Method of carton flap relaxing. 4,551,126, Cl. 493-453.000.
Johnson, Albert D., Sr.: *See*—
Johnson, A. David, Jr.; Bachman, Joseph L., Jr.; Ginther, George E., Sr.; Zimmermann, Charles E.; and Johnson, Albert D., Sr., 4,551,126, Cl. 493-453.000.
Johnson, Carter F.; Larson, Cheryl L.; and Tepley, Judy M. Exterior insulating flexible glazed surface covering, movable and stowable from indoors. 4,550,758, Cl. 160-271.000.
Johnson, Curtis A.; Renlund, Gary M.; Van Buren, Charles E.; and Prochazka, Svante, to General Electric Company. Fabrication of small dense silicon carbide spheres. 4,551,436, Cl. 501-90.000.
Johnson, Curtis A.: *See*—
Renlund, Gary M.; and Johnson, Curtis A., 4,551,496, Cl. 524-322.000.
Johnson, Elmer C., Jr.: *See*—
Plaas, Jon R.; Parker, Keith E.; Keiser, James D.; and Johnson, Elmer C., Jr., 4,551,139, Cl. 604-290.000.
Johnson, Herbert H.: *See*—
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,551,070, Cl. 417-68.000.
Johnson, Joe P. Electrical resistance heater unit. 4,551,614, Cl. 219-355.000.
Johnson & Johnson Baby Products Company: *See*—
Cook, John R.; and James, William A., 4,551,143, Cl. 604-371.000.
Johnson & Johnson Dental Products Company: *See*—
Panzera, Carlino, 4,551,099, Cl. 433-212.100.
Johnson & Johnson Products Inc.: *See*—
Tunc, Deger C., 4,550,449, Cl. 623-16.000.
Johnson, Joyce E. Doubly elastic cushioned carrying strap. 4,550,869, Cl. 224-202.000.
Johnson Matthey plc: *See*—
McFarlane, Glenton P.; and Swift, Steven G., 4,550,743, Cl. 137-68.100.
Johnson, Nicholas D., to National Research Development Corp. Acoustic lens. 4,550,609, Cl. 73-642.000.
Johnson, Richard H.; and Muma, George A., to Brunswick Corporation. Bowling lane duster. 4,550,467, Cl. 15-228.000.
Johnson, Walter E., Jr., to SCM Corporation. Process for the isomerization of limonene to terpinolene. 4,551,570, Cl. 585-355.000.
Johnson, William E. Protective cover for waterfowl callers. 4,551,112, Cl. 446-207.000.
Johnston, Howard; and Troxell, Lillian H., to Dow Chemical Company, The. Herbicidal trifluoromethyl pyridinyloxyphenoxy and pyridinylthiophenoxy propanols and derivatives thereof. 4,551,170, Cl. 71-94.000.
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., to Syntex (U.S.A.) Inc. Method of treating heart failure using

(2-oxo-1,2,3,5-tetrahydroimidazo-[2,1-b]quinazolinyl)oxyalkylamides. 4,551,459, Cl. 514-267.000.

Jones, Harold T.: *See*—
Saverse, Ronald R.; and Jones, Harold T., 4,551,241, Cl. 209-148.000.

Jones, Jesse D.: *See*—
Ragan, Gary S.; and Jones, Jesse D., 4,551,485, Cl. 523-212.000.

Jones, Nigel J.: *See*—
Temple, Stephen; Jones, Nigel J.; and Syrop, Alan N., 4,550,472, Cl. 17-1.00R.

Jones, Robert E. Stop motion switch. 4,551,591, Cl. 200-61.130.

Jones, Wallace R. Sheet construction and method. 4,550,683, Cl. 118-505.000.

Jones, William A. Method of making pictures. 4,551,286, Cl. 264-1.900.

Jonsson, John E.: *See*—
Wall, Lars E.; and Jonsson, John E., 4,551,752, Cl. 358-113.000.

Joshi, Madhusudan: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,550,729, Cl. 128-325.000.

Josselson, Marc; and Henderson, Doug, to Ralston Purina Company. Slicing apparatus. 4,550,636, Cl. 83-743.000.

Jourdan, Jean-Marie; Betelle, Jean; and Bougon, Philippe M. M., to Societe Nationale Industrielle et Aerospatiale. System for producing and distributing electrical energy for vehicles particularly aircraft, as well as an electrical power center for such a system. 4,551,632, Cl. 307-9.000.

Jozepaitis, Charles M.: *See*—
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,551,070, Cl. 417-68.000.

Jung, Eggert, to Dr. Ing. Rudolf Hell GmbH. Color reduction dependent on tone. 4,551,751, Cl. 358-75.000.

Just, Melitta: *See*—
Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,551,454, Cl. 514-252.000.

Juve, Robert J.; and Eagen, Michael J., to McGraw-Edison Company. Micro crane finishing line system. 4,550,682, Cl. 118-425.000.

Kabashima, Katsuhiko: *See*—
Takemae, Yoshihiro; and Kabashima, Katsuhiko, 4,551,822, Cl. 365-222.000.

Kabushiki Kaisha AG: *See*—
Sugihara, Hironobu, 4,551,113, Cl. 446-154.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Ishikawa, Takehiro; Yamazawa, Akira; and Kusumoto, Yasuo, 4,551,031, Cl. 374-117.000.

Kabushiki Kaisha Goto Seisakusho: *See*—
Ishigami, Sumiyuki; and Sato, Mitsuru, 4,550,475, Cl. 29-25.350.

Kabushiki Kaisha Honda Rokku: *See*—
Asaka, Urataro; Kanai, Shigeo; Tanaka, Yasuhiro; and Iwamoto, Kazuya, 4,551,074, Cl. 417-366.000.

Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Tanaka, Akio; and Kamo, Yasuo, 4,550,879, Cl. 241-52.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, 4,550,638, Cl. 84-431.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Abe, Toshio; and Sakurai, Terushige, 4,550,588, Cl. 72-441.000.

Kabushiki Kaisha Meidensha: *See*—
Fushimi, Kazuo; Tsunakawa, Hirokazu; and Yonahara, Kunio, 4,551,267, Cl. 252-511.000.

Kabushiki Kaisha Miyano Tekkosho: *See*—
Yamazaki, Yoshinori; and Ogawa, Tsutomu, 4,550,631, Cl. 74-822.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Aizawa, Hitomi, 4,551,029, Cl. 368-273.000.
Takeda, Koji; Akahane, Masao; Mukaiyama, Fumiaki; and Kudo, Yasuhiko, 4,551,846, Cl. 375-82.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,551,660, Cl. 318-293.000.

Kabushiki Kaisha Toshiba: *See*—
Nishimura, Nobuichi, 4,551,601, Cl. 219-10.55B.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Tanaka, Akira; Tsunekawa, Takahiko; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,550,560, Cl. 57-261.000.

Kaeser, Charles, to P. F. Cosmetique. Facial massage device. 4,550,718, Cl. 128-57.000.

Kagler, Edmond, Jr., to A-Z International Tool Company. Method of and apparatus for cutting and recovering of submarine surface casing. 4,550,781, Cl. 166-340.000.

Kahn, Marvin L.: *See*—
O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., 4,551,348, Cl. 426-639.000.

Kaibel, Gerd: *See*—
Bott, Kaspar; Kaibel, Gerd; Hartmann, Horst; Irnich, Rudolf; and Buelow, Horst, 4,551,208, Cl. 203-60.000.

Kain, Alexander S., to Plenty Limited. Rotary vane pump with two axially spaced sets of vanes. 4,551,079, Cl. 418-26.000.

Kakugo, Masahiro: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Kojima, Junpei; and Wakatsuki, Kizuku, 4,551,501, Cl. 525-88.000.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.

Kambe, Toshiyuki: *See*—
Kubota, Hiromi; and Kambe, Toshiyuki, 4,551,588, Cl. 200-33.00R.

Kaminaga, Seiji: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, 4,551,009, Cl. 355-15.000.

Kammiller, Neil A., to Reliance Electric Company. Voltage sensing at loads remotely connected to power supplies. 4,551,668, Cl. 323-234.000.

Kamo, Yasuo: *See*—
Tanaka, Akio; and Kamo, Yasuo, 4,550,879, Cl. 241-52.000.

Kamyr, Inc.: *See*—
Wiley, William E., 4,551,198, Cl. 159-47.300.

Kanai, Shigeo: *See*—
Asaka, Urataro; Kanai, Shigeo; Tanaka, Yasuhiro; and Iwamoto, Kazuya, 4,551,074, Cl. 417-366.000.

Kanayama, Kiyoshi; and Asano, Shoji, to Nippon Kokan Kabushiki Kaisha; and Nippon Kokan Koji Kabushiki Kaisha. Pipe end cutting apparatus. 4,550,635, Cl. 82-4.00C.

Kanda, Yohichi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Kaneko, Katsumi: *See*—
Nishikawa, Eiichiro; Shinya, Masuo; Ueda, Kayako; and Kaneko, Katsumi, 4,551,556, Cl. 568-403.000.

Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, to Kabushiki Kaisha Kawai Gakki Seisakusho. Portable keyboard-type musical instrument. 4,550,638, Cl. 84-431.000.

Kaneko, Ryoichi: *See*—
Isa, Hitoshi; Kaneko, Ryoichi; and Kashiwahara, Katsuto, 4,550,569, Cl. 60-657.000.

Kaneko, Takeru: *See*—
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.

Kaneko, Yutaka: *See*—
Kimura, Toshihiko; Kaneko, Yutaka; and Sasaki, Takashi, 4,551,422, Cl. 430-551.000.

Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, to Canon Kabushiki Kaisha. Process kit and an image forming apparatus using the same. 4,551,000, Cl. 355-3.00R.

Kang, Jung W.; and Davis, James A., to Firestone Tire & Rubber Company, The. Rubber compositions and articles thereof having improved metal adhesion and metal adhesion retention. 4,551,391, Cl. 428-462.000.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,550,511, Cl. 36-50.000.

Kanpe Katei Toryoo Kabushiki Kaisha: *See*—
Hirao, Katsumi; and Sasaki, Akira, 4,550,865, Cl. 222-402.210.

Kanzawa, Ryosaku: *See*—
Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, 4,550,612, Cl. 73-727.000.

Karliner, Rudolf: *See*—
Kille, Ewald; and Karliner, Rudolf, 4,551,037, Cl. 401-146.000.

Karliner, Rudolf R.; and Carlin, Samuel R., to Wagner Spray Tech Corporation. Paint dispensing system including roller with drip trough. 4,551,036, Cl. 401-131.000.

Karwowski, Jan, to Nabisco Brands, Inc. Process of preparing instant, flaked, wheat farina. 4,551,347, Cl. 426-621.000.

Kasahara, Yasushi: *See*—
Sugiyama, Masami; Shibuya, Hiroko; and Kasahara, Yasushi, 4,551,272, Cl. 260-112.50R.

Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, to Nissan Motor Company, Limited. Vehicle panel speaker for automotive audio system utilizing part of a vehicle panel as a sound-producing medium. 4,551,849, Cl. 381-86.000.

Kasai, Masanao: *See*—
Ito, Michio; Kitajima, Nobuo; Kasai, Masanao; and Ishihara, Shunichi, 4,551,003, Cl. 355-3.00R.

Kasei Optonix, Ltd.: *See*—
Yaguchi, Masachika; Mikami, Tomoki; and Hase, Takashi, 4,551,397, Cl. 428-691.000.

Kashima, Shinji: *See*—
Iizuka, Eiichi; Sando, Tomoji; Kashima, Shinji; and Maki, Masakazu, 4,551,195, Cl. 156-603.000.

Kashiwahara, Katsuto: *See*—
Isa, Hitoshi; Kaneko, Ryoichi; and Kashiwahara, Katsuto, 4,550,569, Cl. 60-657.000.

Kasica, James J.: *See*—
Trubiano, Paolo C.; and Kasica, James J., 4,551,177, Cl. 106-210.000.

Kasparek, Alois; and Burger, Jurgen, to Hauni-Werke Korber & Co. Kg. Apparatus for transporting rod-shaped articles between the discharge ends of pneumatic conveyor pipes and a processing machine. 4,551,040, Cl. 406-28.000.

Kastrup, Eberhard, to Durkoppwerke GmbH. Thread-holding apparatus for buttonhole machine. 4,550,672, Cl. 112-293.000.

Katagiri, Kazuharu: *See*—
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, 4,551,404, Cl. 430-59.000.

Katayama, Takao. Measuring machine. 4,550,506, Cl. 33-143.00L.
Katayama, Tsutomu: *See*—
Kawasaki, Yoichi; and Katayama, Tsutomu, 4,551,351, Cl. 426-656.000.
Katinka, Michael: *See*—
Danos, Olivier; Katinka, Michael; and Yaniv, Moshe, 4,551,270, Cl. 260-112.50R.
Kato, Kenichi: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.
Katoh, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Oil pressure switch. 4,551,594, Cl. 200-82.00R.
Katz, Irving M., to Merck & Co., Inc. Ophthalmic use of norfloxacin and related antibiotics. 4,551,456, Cl. 514-254.000.
Katzman, Howard A.: *See*—
Gaulin, Camille A.; and Katzman, Howard A., 4,551,487, Cl. 523-215.000.
Kavesh, Sheldon; and Prevorsek, Dusan C., to Allied Corporation. Producing high tenacity, high modulus crystalline article such as fiber or film. 4,551,296, Cl. 264-177.00F.
Kawachi, Takeshi: *See*—
Kita, Daizo; Nakamura, Tsutomu; and Kawachi, Takeshi, 4,551,256, Cl. 252-8.5LC.
Kawagoe, Nobukazu: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Kawagoe, Nobukazu; Naruse, Kazuhiko; and Inaba, Masahito, 4,551,011, Cl. 355-35.000.
Kawaguchi, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Disc brake system with fan means. 4,550,809, Cl. 188-18.00A.
Kawajiri, Masayuki, to Dai Nippon Insatsu Kabushiki Kaisha. Method of offset printing on polypropylene resin cases for video tape cassettes. 4,551,360, Cl. 427-160.000.
Kawakami, Hidehiko: *See*—
Tsuchiya, Hiroyoshi; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Otsuka, Hirotaka, 4,551,768, Cl. 358-283.000.
Kawakami, Hiromi: *See*—
Ogawa, Masumi; Kawakami, Hiromi; and Meguro, Toshiaki, 4,551,756, Cl. 358-197.000.
Kawamoto, Hiromi: *See*—
Hayakawa, Masanori; Yamada, Noriaki; Kawamoto, Hiromi; and Nishimura, Satoshi, 4,551,260, Cl. 252-62.590.
Kawamoto, Mutsumi, to Aisin Warner Kabushiki Kaisha. Continuously variable speed transmission for motor vehicles. 4,550,629, Cl. 74-689.000.
Kawamura, Katsuaki: *See*—
Kurosaki, Masanori; and Kawamura, Katsuaki, 4,551,855, Cl. 455-161.000.
Kawamura, Kunio: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,550,993, Cl. 354-402.000.
Kawano, Junji: *See*—
Kubo, Takeshi; Kawano, Junji; Takahashi, Fumio; and Yamaguchi, Tsutomu, 4,551,729, Cl. 346-1.100.
Kawasaki Steel Corporation: *See*—
Ehiro, Takashi; Tanaka, Teruaki; and Yamanaka, Eisuke, 4,550,582, Cl. 72-234.000.
Kawasaki, Yoichi; and Katayama, Tsutomu, to Fuji Oil Company, Limited. Process for producing meat block-like protein material. 4,551,351, Cl. 426-656.000.
Kawashima, Yutaka: *See*—
Suzuki, Atsushi; Ninomiya, Masakazu; Maeda, Katsuya; and Kawashima, Yutaka, 4,550,701, Cl. 123-436.000.
Kay, John F.: *See*—
Canning, John L.; and Kay, John F., 4,551,390, Cl. 428-431.000.
Keane, James W., to Whirlpool Corporation. Electrical hose swivel connector for canister vacuum cleaner. 4,550,957, Cl. 339-5.00R.
Keeling, Michael R.: *See*—
Lewis, John D.; Keeling, Michael R.; Bowen, David R.; and Paton, Anthony D., 4,551,731, Cl. 346-75.000.
Keiser, James D.: *See*—
Plaas, Jon R.; Parker, Keith E.; Keiser, James D.; and Johnson, Elmer C., Jr., 4,551,139, Cl. 604-290.000.
Keller, George E., II: *See*—
Robson, John H.; and Keller, George E., II, 4,551,566, Cl. 568-867.000.
Kelly, James B.: *See*—
Callahan, David J.; Mazzawy, Robert S.; Stryker, Howard Y.; and Kelly, James B., 4,550,564, Cl. 60-39.093.
Kelly, Lawrence A., to Sandoz, Inc. Processes for the preparation of liposome drug delivery systems. 4,551,288, Cl. 264-4.600.
Ken-Ichi, Sawara: *See*—
Takayuki, Okada; Hisao, Tanaka; Ken-Ichi, Sawara; and Tsutomu, Konaka, 4,551,509, Cl. 526-68.000.
Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Bone prosthesis with porous coating. 4,550,448, Cl. 623-16.000.
Kennametal Inc.: *See*—
Isakov, Edmund, 4,550,791, Cl. 175-410.000.
Kern, Donald L.; Hokanson, Gerard C.; and French, James C., to Warner-Lambert Company. Guanine-N^7-oxide. 4,551,529, Cl. 544-265.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; Fritz, Wolfgang; Steinhaus, Harald; and Bley, Peter, 4,551,157, Cl. 55-17.000.
Kerns, David V.: *See*—
Kerns, David V., Jr.; and Kerns, David V., 4,551,685, Cl. 330-86.000.
Kerns, David V., Jr.; and Kerns, David V. Programmable gain feedback amplifier. 4,551,685, Cl. 330-86.000.
Kerr, Stanley R. Inflatable packaging material. 4,551,379, Cl. 428-200.000.
Kervagoret, Alain. Method for improving the performance of an internal combustion engine, device for implementing the method, and internal combustion engine equipped with said device. 4,550,707, Cl. 123-669.000.
Kesling, Peter C. Edgewise bracket wire retaining clip. 4,551,094, Cl. 433-8.000.
Kesser Electronics International, Inc.: *See*—
Barnum, Charly, 4,551,654, Cl. 315-159.000.
Kessler, Milton. Lubricated fin pile-type weatherstrip. 4,551,376, Cl. 428-85.000.
Kesson, James, to Scottish & Newcastle Breweries plc. Method of and apparatus for monitoring concentration of gas in a liquid. 4,550,590, Cl. 73-19.000.
Ketchman, Jeffery: *See*—
Storace, Anthony; and Ketchman, Jeffery, 4,551,806, Cl. 364-473.000.
Kettlety, Robert W.: *See*—
McTamaney, Louis S.; Bisbee, Gary W.; Kettlety, Robert W.; and Konsevich, James L., 4,551,730, Cl. 346-33.0WL.
Keyes, Gary S.: *See*—
Riederer, Stephen J.; and Keyes, Gary S., 4,551,800, Cl. 364-414.000.
Khoroshikh, Vladimir M.: *See*—
Axenov, Ivan I.; Bren, Viktor G.; Padalka, Valentin G.; Sablev, Leonid P.; Stupak, Rimma I.; and Khoroshikh, Vladimir M., 4,551,221, Cl. 204-298.000.
Kidani, Yoshinori; and Noji, Masahide, to Yoshinori Kidani. Platinum complexes of glucuronic acid. 4,551,524, Cl. 536-121.000.
Kikuchi, Yasuharu: *See*—
Eda, Kazuo; Kikuchi, Yasuharu; Makino, Osamu; and Matsuoka, Michio, 4,551,268, Cl. 252-519.000.
Kikuchi, Yasuyuki; Matsumoto, Eiichi; and Tanaka, Yoshimasa, to Nissan Motor Company, Limited. Fan device for internal combustion engine. 4,550,695, Cl. 123-41.120.
Kikugawa, Shozo: *See*—
Koyama, Mikio; Kikugawa, Shozo; and Okaniwa, Kenichiro, 4,551,307, Cl. 422-56.000.
Kille, Ewald; and Karliner, Rudolf, to J. Wagner GmbH. Device for applying paint with reciprocating linear motor. 4,551,037, Cl. 401-146.000.
Killian, Edmund F., to Waldes Kohinoor, Inc. Methods and apparatus for installing a radially applied retaining ring into an external groove of a workpiece. 4,550,485, Cl. 29-450.000.
Kilroy, Stanley A. R., to Alpen Dairy Foods Pty. Limited. Method of producing an edible fat emulsion and food product produced thereof. 4,551,346, Cl. 426-602.000.
Kimura, Hiroshi: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, 4,551,009, Cl. 355-15.000.
Kimura, Toshihiko; Kaneko, Yutaka; and Sasaki, Takashi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,551,422, Cl. 430-551.000.
Kinas, Henry, to Societe Anonyme H.K. France. Device for reproducing coded keys. 4,551,046, Cl. 409-82.000.
Kinast, Karlheinz: *See*—
Wiegard, Klaus; Kinast, Karlheinz; Kleinekathofer, Wolfgang; and Tank, Eggert, 4,551,396, Cl. 428-678.000.
King, Arthur S. Liquid treater having hinge-action cleaning brushes. 4,551,217, Cl. 204-212.000.
King-Seeley Thermos Co.: *See*—
Tarozzi, R. A.; and Formhals, C., 4,550,864, Cl. 222-209.000.
King, Wayne: *See*—
Flugger, Ray T., 4,550,799, Cl. 181-244.000.
Kinnett, James G. Total shoulder prosthesis system. 4,550,450, Cl. 623-18.000.
Kinoshita, Kunio, to Olympus Optical Company. Liquid supplying device for endoscope. 4,550,716, Cl. 128-6.000.
Kinoshita, Takao: *See*—
Masunaga, Makoto; and Kinoshita, Takao, 4,551,758, Cl. 358-213.000.
Kirchberger, Peter, to GFM Gesellschaft Fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H. Inserted tooth cutter. 4,551,043, Cl. 407-43.000.
Kirin Beer Kabushiki Kaisha: *See*—
Reich, Frederich R., 4,551,627, Cl. 250-339.000.
Kirk, Norbert A. Vegetable peeler. 4,550,656, Cl. 99-590.000.
Kishimoto, Juji: *See*—
Sado, Ichiro; Kishimoto, Juji; Sasaki, Masayuki; and Cho, Mitsuo, 4,551,818, Cl. 364-900.000.
Kiss, Bela: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.
Kita, Daizo; Nakamura, Tsutomu; and Kawachi, Takeshi, to Ohbayashi-Gumi, Ltd.; and Kuraray Co., Ltd. Slurry excavating method. 4,551,256, Cl. 252-8.5LC.

Kitajima, Nobuo: *See*—
Ito, Michio; Kitajima, Nobuo; Kasai, Masanao; and Ishihara, Shunichi, 4,551,003, Cl. 355-3.00R.
Kitamura, Kazuo; and Suezawa, Mitsuru, to Toray Industries, Inc. Coating composition and the use thereof. 4,551,516, Cl. 528-18.000.
Klaus, Kaspar. Device for the parking of automobile vehicles. 4,551,054, Cl. 414-229.000.
Klawitter, Ronald R., to Handi-Pac, Inc. Toy computer image processor assembly. 4,550,503, Cl. 33-18.00R.
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, to Degussa Aktiengesellschaft. Process for the recovery of S-(carboxymethyl)-(R)-cysteine and S-(carboxymethyl)-(S)-cysteine. 4,551,548, Cl. 562-402.000.
Kleemann, Axel: *See*—
Drauz, Karlheinz; and Kleemann, Axel, 4,551,562, Cl. 568-771.000.
Klein, Joseph T.: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,551,474, Cl. 514-309.000.
Kleinekathofer, Wolfgang: *See*—
Wiegard, Klaus; Kinast, Karlheinz; Kleinekathofer, Wolfgang; and Tank, Eggert, 4,551,396, Cl. 428-678.000.
Klosk, Lawrence. Apparatus for transporting wheel and axle assemblies. 4,551,049, Cl. 410-42.000.
Kluth, Hermann: *See*—
Herold, Julius; Kluth, Hermann; Meffert, Alfred; and Leder, Manfred, 4,551,517, Cl. 528-60.000.
Knappe, Wolfgang-Reinhold: *See*—
Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, 4,551,428, Cl. 435-19.000.
Kneitel, Dieter: *See*—
Strack, Hans; Roebke, Wolfgang; Kneitel, Dieter; and Parr, Ehrfried, 4,551,322, Cl. 423-329.000.
Knoch, Darrell G. Heat recovery device for exhaust flues. 4,550,772, Cl. 165-47.000.
Kobayashi, Ryoichi: *See*—
Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, 4,550,612, Cl. 73-727.000.
Kobayashi, Waichi; and Takahata, Satoru, to UBE Industries, Ltd. Aqueous anodizing solution and process for coloring article of magnesium or magnesium-base alloy. 4,551,211, Cl. 204-37.600.
Kobishi Electric Co., Ltd.: *See*—
Ogino, Satoru, 4,550,970, Cl. 339-97.00P.
Kobori, Shigeyuki: *See*—
Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, 4,550,612, Cl. 73-727.000.
Kochert, Wilfried, to Computer Gesellschaft Konstanz mbH. Circuit arrangement for machine character recognition. 4,551,851, Cl. 382-38.000.
Kock, Ronald W.; and Esposito, John A., to Procter & Gamble Company, The. Method for uniformly distributing discrete particles on a moving porous web. 4,551,191, Cl. 156-276.000.
Kodachi, Hideo: *See*—
Okubo, Takeshi; Kodachi, Hideo; and Miyanaka, Masaki, 4,550,488, Cl. 29-568.000.
Koenig, Heribert: *See*—
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.
Koenig, Robert H.; and Lovell, Walter, to Tapeswitch Corporation of America. Tape switch with corrugated wavy conductor. 4,551,595, Cl. 200-86.00R.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Torque detector. 4,550,618, Cl. 73-862.340.
Kohler, Alfred: *See*—
Deutscher, Hans-Christian; Kohler, Alfred; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,550,469, Cl. 15-250.340.
Koichi, Yasushi, to Ricoh Company Ltd. Method of forming images of sensor patterns in effecting image density control of electrophotographic copying apparatus. 4,551,005, Cl. 355-8.000.
Koike, Hiroshi; Takeuchi, Shuhei; and Miyajima, Mikio, to Alps Electric Co., Ltd. Serial electric printer using single unidirectional motor. 4,551,033, Cl. 400-308.000.
Koizumi, Satoru; Furuhara, Hiroshi; and Teshima, Daisuke, to Sharp Kabushiki Kaisha. Tape recorder with two recording/playing mechanisms. 4,551,775, Cl. 360-74.100.
Kojima, Junpei: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Kojima, Junpei; and Wakatsuki, Kizuku, 4,551,501, Cl. 525-88.000.
Kojima, Tetsuro: *See*—
Sugimoto, Naohiko; and Kojima, Tetsuro, 4,551,420, Cl. 430-505.000.
Kokubo, Tadayoshi: *See*—
Ikeda, Tadashi; Kuwabara, Kenichi; Yamamuro, Kiyohiko; and Kokubo, Tadayoshi, 4,551,424, Cl. 430-588.000.
Kolar, Karel: *See*—
Skvara, Frantisek; Kolar, Karel; Zadak, Zdenek; Friml, Zdenek; and Novotry, Jaroslay, 4,551,176, Cl. 106-90.000.
Kollmeyer, Willy D., to Shell Oil Company. Beta-imidazolyl-alpha-(trifluoromethyl)ethenyl phosphates and insecticidal and miticidal use. 4,551,447, Cl. 514-94.000.
Kollmorgen Technologies Corporation: *See*—
Brown, Gerald W., 4,551,646, Cl. 310-242.000.
Leech, Edward J.; and Russo, Frank D., 4,551,488, Cl. 523-427.000.
Kolobow, Theodor; and Ito, Yoichiro, to United States of America, Health and Human Services. Monolithic integrated flow circuit. 4,551,251, Cl. 210-635.000.
Komatsu, Toshiyuki: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,551,405, Cl. 430-64.000.
Komatsu, Yoshimi: *See*—
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,173, Cl. 75-12.000.
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,174, Cl. 75-12.000.
Konagai, Makoto: *See*—
Takahashi, Kiyoshi; Konagai, Makoto; Yoshitomi, Toshihiko; and Omori, Takeshi, 4,551,575, Cl. 136-255.000.
Kondo, Akinobu: *See*—
Nakamura, Kazuharu; Tsuboi, Yoshimasa; and Kondo, Akinobu, 4,550,709, Cl. 126-96.000.
Kondo, Mikio: *See*—
Akiyama, Shoichi; and Kondo, Mikio, 4,551,711, Cl. 340-567.000.
Kondo, Tsuneo: *See*—
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,173, Cl. 75-12.000.
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,174, Cl. 75-12.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kimura, Toshihiko; Kaneko, Yutaka; and Sasaki, Takashi, 4,551,422, Cl. 430-551.000.
Koyama, Mikio; Kikugawa, Shozo; and Okaniwa, Kenichiro, 4,551,307, Cl. 422-56.000.
Moriguchi, Hiroyuki; Matsumoto, Masanori; Nishiwaki, Akira; Morohoshi, Yasuo; and Nomori, Hiroyuki, 4,551,303, Cl. 420-590.000.
Nagatani, Toshio; Chiba, Norio; Hatanaka, Takao; and Saito, Toshio, 4,551,367, Cl. 428-35.000.
Konnai, Makoto: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Morinaka, Hideo; Nonaka, Yunji; and Nakanishi, Akira, 4,551,169, Cl. 71-94.000.
Konneker, Reinhard, to Harley-Davidson Motor Co., Inc. Internal combustion engine mount. 4,550,698, Cl. 123-195.0AC.
Konno, Kazutoshi: *See*—
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.
Konsevich, James L.: *See*—
McTamaney, Louis S.; Bisbee, Gary W.; Kettlety, Robert W.; and Konsevich, James L., 4,551,730, Cl. 346-33.0WL.
Kopolow, Steven L., to Personal Products Company. Flexible absorbent boards. 4,551,142, Cl. 604-368.000.
Korsunsky, Iosif: *See*—
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,550,959, Cl. 339-9.00E.
Korth, Jurgen, to P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG. Hydraulic fluid distributor. 4,550,750, Cl. 137-868.000.
Kosan Teknova A/S: *See*—
Hansen, Frits U.; and Jensen, Ove, 4,550,746, Cl. 137-461.000.
Kovacena, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., to United States of America, Navy. Bis(pentafluorosulfur)diacetylene polymer therefrom and preparations thereof. 4,551,349, Cl. 427-255.600.
Kovach, Stephen M.; and Palmer, James L., to Ashland Oil, Inc. Ammonia contacting to passivate metals deposited on a cracking catalyst during reduced crude processing. 4,551,231, Cl. 208-120.000.
Kovacs, Carl W.: *See*—
Hadley, Russell F.; and Kovacs, Carl W., 4,551,672, Cl. 324-133.000.
Kovalenko, Igor L.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.
Koyama, Arata: *See*—
Honma, Ichiro; Koyama, Arata; Amano, Masatoshi; and Takumi, Nobusuke, 4,551,327, Cl. 423-594.000.
Koyama, Koichi; Noguchi, Yasuhiro; and Toriuchi, Masaharu, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material with nucleophilic displacement dye releasers. 4,551,423, Cl. 430-559.000.
Koyama, Mikio; Kikugawa, Shozo; and Okaniwa, Kenichiro, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,551,307, Cl. 422-56.000.
Koziar, Greg: *See*—
Malcosky, Norman D.; and Koziar, Greg, 4,551,154, Cl. 48-193.000.
Kozlik, Tony J., to Honeywell Inc. Method for initializing a token-passing local-area network. 4,551,721, Cl. 340-825.520.
Kracke, Heinrich: *See*—
Bottcher, Hugo; Heimrich, Klaus; Hildebrandt, Gustav; Kracke, Heinrich; and Richter, Johannes, 4,551,297, Cl. 264-224.000.
Kraft, Derald H.; and Hitchcock, Gary L., to Dyneer Corporation. Manufacture of poly-V sheet metal pulleys and product. 4,551,122, Cl. 474-170.000.
Kraftwerke Union AG: *See*—
Raschke, Klaus; and Exner, Gerhard, 4,551,063, Cl. 415-115.000.
Krag, Mark D., to Dental Preventech, Inc. Device for cleaning teeth to prevent the formation of plaque. 4,550,741, Cl. 132-89.000.

Kreuzenstein, Ronald K.: *See*—
Amdahl, Gene M.; Hanson, Donald L.; Kreuzenstein, Ronald K.; Roshon-Larsen, Gwynne L.; and Woffinden, Gary A., 4,551,797, Cl. 364-200.000.

Krikorian, Donald J., to C. R. Bard, Inc. Adjustable check valve. 4,550,749, Cl. 137-843.000.

Krinitskaya, Ljudmila V.: *See*—
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.

Kritz, Jacob A., to Sperry Corporation. Multiple beam lens transducer with collimator for sonar systems. 4,551,826, Cl. 367-150.000.

KRKA, tovarna zdravil, n.sol.o.: *See*—
Zupancic, Natasa; Sket, Boris; Zupet, Pavel; and Zupan, Marko, 4,551,525, Cl. 544-49.000.

Kronenthal, David: *See*—
Slusarchyk, William A.; and Kronenthal, David, 4,551,276, Cl. 260-239.00A.

Kroner, Holger, to Endress u. Hauser GmbH u. Co. Capacitive sensor. 4,551,785, Cl. 361-284.000.

Krucker, Karl: *See*—
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Drive shaft assembly. 4,551,116, Cl. 464-97.000.

Krug, Herbert: *See*—
Dockner, Toni; and Krug, Herbert, 4,551,528, Cl. 544-242.000.

Krug, Russell R.: *See*—
Pecoraro, Theresa A.; Krug, Russell R.; and Deady, Joanne, 4,551,229, Cl. 208-76.000.

Krumme, John F.; and Hodgson, Darel E., to Alchemia Ltd. Partnership. Stapling device. 4,550,870, Cl. 227-19.000.

Krumwiede, John F.: *See*—
Savolskis, Edward P.; and Krumwiede, John F., 4,551,161, Cl. 65-27.000.

Kubo, Takeshi; Kawano, Junji; Takahashi, Fumio; and Yamaguchi, Tsutomu, to Shinko Electric Co., Ltd. Method of making thermal transfer type multicolor printing. 4,551,729, Cl. 346-1.100.

Kubo, Teruyuki: *See*—
Sekiguchi, Koichi; Takematsu, Hikaru; Yamamoto, Kazuyuki; and Kubo, Teruyuki, 4,551,583, Cl. 179-99.00M.

Kubota, Hiromi; and Kambe, Toshiyuki, to Tokyo Electric Co., Ltd. Timer device. 4,551,588, Cl. 200-33.00R.

Kudo, Yasuhiko: *See*—
Takeda, Koji; Akahane, Masao; Mukaiyama, Fumiaki; and Kudo, Yasuhiko, 4,551,846, Cl. 375-82.000.

Kuhlein, Klaus: *See*—
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.

Kuhlmann, Erven J., to Texaco Inc. Coal liquefaction process. 4,551,224, Cl. 208-10.000.

Kuhlmann, Gerhard; and Remmele, Bernhard, to Robert Bosch GmbH. Compass saw with a connecting device for a flat saw blade. 4,550,500, Cl. 30-392.000.

Kuhn, Falk; and Buck, Alfred, to Memminger GmbH. Knitting machine with rocking knock-over bits, and method of knitting therewith. 4,550,577, Cl. 66-104.000.

Kuhn, Werner H.: *See*—
Swinehart, Steven L.; and Kuhn, Werner H., 4,551,763, Cl. 358-225.000.

Kuhr, Manfred: *See*—
Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, 4,551,428, Cl. 435-19.000.

Kukes, Simon G.; and Nowack, Gerhard P., to Phillips Petroleum Company. Demetallization of hydrocarbon feed streams with nickel arsenide. 4,551,230, Cl. 208-89.000.

Kukuchek, George S.: *See*—
Haeber, John A.; Rains, John K.; Beitler, Brad D.; and Kukuchek, George S., 4,550,936, Cl. 285-26.000.

Kulesza, Ralph J.; Rosenwinkel, Donald A.; and Diako, Harry, to Marvin Glass & Associates. Sprinkler toy. 4,550,876, Cl. 239-211.000.

Kulig, Constantine W.: *See*—
Duga, Robert J.; Kulig, Constantine W.; Doughty, Robert L.; Douglas, Robert J.; and Andersen, Robert P., 4,551,163, Cl. 65-129.000.

Kumazawa, Satoru: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Kumazawa, Takashi: *See*—
Hironaka, Yoshio; and Kumazawa, Takashi, 4,551,555, Cl. 568-401.000.

Kunert, Heinz, to Saint-Gobain Vitrage. Laminated safety glass. 4,551,372, Cl. 428-38.000.

Kuniya, Keiichi: *See*—
Watanabe, Ryuji; Ando, Hisashi; Kuniya, Keiichi; and Kurosawa, Yukio, 4,551,396, Cl. 200-144.00B.

Kuno, Hiroaki: *See*—
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, 4,551,082, Cl. 418-55.000.

Kunz Maschinen- und Apparatebau GmbH: *See*—
Kunz, Wolfgang, 4,551,117, Cl. 464-106.000.

Kunz, Wolfgang, to Kunz Maschinen- und Apparatebau GmbH. Device for transmitting torque to a reel or the like. 4,551,117, Cl. 464-106.000.

Kupcikevicius, Vytautas: *See*—
Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, 4,550,471, Cl. 17-1.00R.

Kuraray Co., Ltd.: *See*—
Kita, Daizo; Nakamura, Tsutomu; and Kawachi, Takeshi, 4,551,256, Cl. 252-8.5LC.
Matsumoto, Mitsuo; Hirai, Koji; Yoshimura, Noriaki; and Okamura, Takayuki, 4,551,518, Cl. 528-80.000.

Kurata, Masami, to Fuji Xerox Co., Ltd. Color picture reading system. 4,551,750, Cl. 358-75.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Kuroki, Kazuo, to Fuji Electric Company, Ltd. Circuit for driving the base of a transistor. 4,551,635, Cl. 307-254.000.

Kurosaki, Masanori; and Kawamura, Katsuaki, to Pioneer Electronic Corporation. Radio communications system for detecting the coincidence of decoded information. 4,551,855, Cl. 455-161.000.

Kurosawa, Yukio: *See*—
Watanabe, Ryuji; Ando, Hisashi; Kuniya, Keiichi; and Kurosawa, Yukio, 4,551,596, Cl. 200-144.00B.

Kurtz, Robert J.; and LiCausi, Joseph, to BioResearch Inc. Orthopedic foot splint with swivel and stop. 4,550,722, Cl. 128-80.00A.

Kurtz, Rudiger: *See*—
Holik, Herbert; and Kurtz, Rudiger, 4,551,204, Cl. 162-336.000.

Kussy, Frank W. Current limiting circuit breaker mechanism. 4,551,697, Cl. 335-16.000.

Kusumoto, Yasuo: *See*—
Ishikawa, Takehiro; Yamazawa, Akira; and Kusumoto, Yasuo, 4,551,031, Cl. 374-117.000.

Kuwabara, Kenichi: *See*—
Ikeda, Tadashi; Kuwabara, Kenichi; Yamamuro, Kiyohiko; and Kokubo, Tadayoshi, 4,551,424, Cl. 430-588.000.

KV Pharmaceutical Company: *See*—
Riley, Thomas C., Jr.; Tharp, Charles P.; and Lapka, Galen G., 4,551,148, Cl. 604-890.000.

Kyosan Denki Kabushiki Kaisha: *See*—
Ohgaki, Kichio; and Ohshima, Kazuhiro, 4,551,071, Cl. 417-313.000.

Kysor Industrial Corporation: *See*—
Babb, John H., Jr.; and Marotto, Robert A., 4,550,939, Cl. 292-340.000.

L. & C. Steinmuller GmbH: *See*—
Leikert, Klaus; Buttner, Gerhard; and Michelfelder, Sigfrid, 4,551,090, Cl. 431-188.000.

L. P. Systems Corporation: *See*—
Runyon, Wayne; and Hower, Larry, 4,550,728, Cl. 128-303.180.

Laapotti, Jorma, to Valmet Oy. Press section without press suction rollers in a paper machine. 4,551,205, Cl. 162-360.100.

LaBate, Michael D., II. Air cooled refractory lance. 4,550,898, Cl. 266-220.000.

Labeda, David P.: *See*—
Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., 4,551,533, Cl. 546-35.000.

La Bonte, David E.; Richter, Kurt W.; and Goehler, Robert F., to Ingersoll-Rand Company. Plural-amplitude vibration assembly. 4,550,622, Cl. 74-87.000.

Laboratori Baldacci SpA: *See*—
Marsili, Antonio, 4,551,453, Cl. 514-234.000.

Lacy, Sylvia M.: *See*—
Merchant, Philip; and Lacy, Sylvia M., 4,551,239, Cl. 208-188.000.

Ladisch, Stephan, to University of California, The Regents of the. Avoidance of the immunosuppressive and antiproliferative effects of lipid emulsions. 4,551,449, Cl. 514-182.000.

Lake, Connie, to Creative Industries, Inc. Convertible mold. 4,551,084, Cl. 425-185.000.

Lal, Joginder; and Senyek, Michael L., to Goodyear Tire & Rubber Company, The. Preparation of interpolymers of alpha-olefins and nonconjugated alpha, omega-dienes. 4,551,503, Cl. 525-332.100.

Lamarche, Jean L.: *See*—
Buck, Robert; and Lamarche, Jean L., 4,551,637, Cl. 307-308.000.

Lambert Brake Corporation: *See*—
Euler, John W., 4,550,817, Cl. 192-70.230.

Lamoure, Jean F. Industrial building framework formed from prefabricated reinforced concrete elements. 4,550,536, Cl. 52-91.000.

Landis, John M.: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,550,960, Cl. 339-14.00R.

Lane, Edward S.; and Hill, Michael R. H., to United Kingdom Atomic Energy Authority. Electrode preparation. 4,551,358, Cl. 427-126.600.

Lane, Stephen A.: *See*—
Goldstein, Norman P.; and Lane, Stephen A., 4,551,298, Cl. 376-245.000.

Lang, Siegfried: *See*—
Straub, Ferdinand; Sanner, Axel; Seib, Karl; and Lang, Siegfried, 4,551,512, Cl. 526-264.000.

Lange , Francois: *See*—
Cornet, Jean; Lange , Francois; Le Carvennec, Francois; Lehureau, Jean-Claude; and Rascle, Roger, 4,551,733, Cl. 346-137.000.

Lange, Robert E.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,550,657, Cl. 100-43.000.

Langer, Alfred, to Nordson Corporation. Fluid pressure operated piston engine assembly. 4,550,642, Cl. 91-346.000.

Lansinger, Jere R.; Dorr, George D.; and Farago, Paul L., to Chrysler Corporation. Self-adjusting shift indicator for automatic transmission. 4,550,675, Cl. 116-28.100.

Lapka, Galen G.: *See*—
Riley, Thomas C., Jr.; Tharp, Charles P.; and Lapka, Galen G., 4,551,148, Cl. 604-890.000.

Larnerd, John D.: *See*—
Darrow, Russell E.; Ingraham, Glenn J.; Larnerd, John D.; and Nesky, Robert W., 4,550,493, Cl. 29-739.000.

Larsen, Grant: *See*—
Good, Jack E., 4,550,839, Cl. 211-189.000.

Larsen, Marian: *See*—
Good, Jack E., 4,550,839, Cl. 211-189.000.

Larson, Cheryl L.: *See*—
Johnson, Carter F.; Larson, Cheryl L.; and Tepley, Judy M., 4,550,758, Cl. 160-271.000.

La See, Jack, to La See, Jack. Vision panel frame. 4,550,542, Cl. 52-476.000.

Latasiewicz, Leonard, to Motorola, Inc. Multiple contact layer membrane switch. 4,551,586, Cl. 200-5.00A.

Laudat, Pierre: *See*—
Sanchez, Pierre; and Laudat, Pierre, 4,551,319, Cl. 423-316.000.

Laudt, Jurgen, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Switch box and closure therefor. 4,550,852, Cl. 220-327.000.

Lauer, Ernst H.; and Reynolds, Joseph D., to Eaton Corporation. Transmission shifting mechanism. 4,550,627, Cl. 74-475.000.

Laukien, Gunther: *See*—
Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, 4,551,694, Cl. 333-24.00C.

Lauks, Imants R., to Integrated Ionics, Inc. Method of calibrating conductive metal oxide electrodes. 4,551,209, Cl. 204-1.00T.

Lavallee, Francois A., to Essex Group, Inc. Tetraalkyl titanate modified nylon magnet wire insulation coating. 4,551,398, Cl. 428-383.000.

LaValley, Roger O.: *See*—
Seely, Earle S.; and LaValley, Roger O., 4,551,782, Cl. 361-151.000.

Lawson, John E., to Armco Inc. Method and apparatus for independent support of well pipe hangers. 4,550,782, Cl. 166-382.000.

Lawson & Jones Limited: *See*—
Fleming, James W., 4,550,873, Cl. 229-30.000.

Layson, Alfred M. Fish decoy. 4,550,518, Cl. 43-2.000.

Lazar, Laszlo : *See*—
Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,551,132, Cl. 604-52.000.

Lazarus, Harry J. Dual-torque winding and tightening tool. 4,551,097, Cl. 433-39.000.

Leach, Roger J. Layered mirrors including a compressible layer and a polyurethane skin. 4,550,986, Cl. 350-641.000.

Le Carvennec, Francois: *See*—
Cornet, Jean; Lange , Francois; Le Carvennec, Francois; Lehureau, Jean-Claude; and Rascle, Roger, 4,551,733, Cl. 346-137.000.

Lechner, Peter: *See*—
Hofbauer, Edwin; Lechner, Peter; and Exler, Heribert, 4,551,051, Cl. 414-21.000.

Leder, Manfred: *See*—
Herold, Julius; Kluth, Hermann; Meffert, Alfred; and Leder, Manfred, 4,551,517, Cl. 528-60.000.

Lederhose, Edgar K.: *See*—
Bouffard, Jean; Dumoulin, Andre ; and Lederhose, Edgar K., 4,550,558, Cl. 57-58.520.

Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., to American Cyanamid Company. Antibiotic LL-D42067α. 4,551,533, Cl. 546-35.000.

Leech, Edward J.; and Russo, Frank D., to Kollmorgen Technologies Corporation. Epoxy resin based protective coating composition for printed circuit boards. 4,551,488, Cl. 523-427.000.

Lefebvre, Fredrick L. Cable structure for immersion heaters or the like. 4,551,619, Cl. 219-523.000.

Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, to BASF Aktiengesellschaft. Production of magnetic recording media. 4,551,359, Cl. 427-130.000.

Lehtikoski, Olavi; and Nissinen, Martti. Apparatus for automatic determination of the tensile strength properties of a sheet of paper. 4,550,613, Cl. 73-834.000.

Lehto, Ari: *See*—
Luukkala, Mauri; and Lehto, Ari, 4,551,030, Cl. 374-5.000.

Lehureau, Jean-Claude: *See*—
Cornet, Jean; Lange , Francois; Le Carvennec, Francois; Lehureau, Jean-Claude; and Rascle, Roger, 4,551,733, Cl. 346-137.000.

Leiber, Heinz, to Robert Bosch GmbH. Hydraulic vehicle brake system. 4,550,954, Cl. 303-92.000.

Leich, Joseph E.: *See*—
Carson, Donald W.; Penrose, Lee; Leich, Joseph E.; and Caugherty, William C., 4,550,455, Cl. 4-480.000.

Leikert, Klaus; Buttner, Gerhard; and Michelfelder, Sigfrid, to L. & C. Steinmuller GmbH. Burner. 4,551,090, Cl. 431-188.000.

Leitz, Richard: *See*—
Trage, Burghard; Hintzen, Franz-Josef; and Leitz, Richard, 4,550,570, Cl. 60-693.000.

Lemke, James U., to Eastman Kodak Company. Method of manufacturing a multitrack magnetic head. 4,550,492, Cl. 29-603.000.

Lenac, Nevio, to Dorr-Oliver Incorporated. Filter drum for rotary drum vacuum filter. 4,551,248, Cl. 210-404.000.

L'Etat Francais represente par le Ministre des PTT (Centre National d'Etudes des Telecommunications): *See*—
Botrel, Jose ; Harari, Sami; Briere, Joseph; and Louvel, Bernard, 4,551,839, Cl. 371-35.000.

Levin, Michael M., to Cybernetic Data Products. Packet switching system. 4,551,720, Cl. 340-825.520.

Levine, Peter A., to RCA Corporation. Dark-current level regulation in solid-state devices. 4,551,762, Cl. 358-221.000.

Levine, Richard W., to Construction Technology, Inc. Method and apparatus for designing duct work and for producing patterns for conduit sections in the designed duct work. 4,551,810, Cl. 364-475.000.

Levinson, Frank H.; and Schweizer, Rudolph C., to AT&T Bell Laboratories. Optical coupling devices. 4,550,975, Cl. 350-96.180.

Lewis, John D.; Keeling, Michael R.; Bowen, David R.; and Paton, Anthony D., to Cambridge Consultants Limited. Ink jet printing apparatus correctional in drop placement errors. 4,551,731, Cl. 346-75.000.

Ley, Stephen J.: *See*—
Elves, John; and Ley, Stephen J., 4,551,377, Cl. 428-137.000.

Leybold-Heraeus GmbH: *See*—
Reich, Gunter, 4,550,593, Cl. 73-40.700.

Li, Eric K.: *See*—
Hower, Philip L.; and Li, Eric K., 4,551,353, Cl. 427-39.000.

Li, George S., to Standard Oil Company. Permselective membrane compositions for gas separations and process for the separation of gases therewith. 4,551,156, Cl. 55-16.000.

Li, Hsueh M., to Ethyl Corporation. Phosphonitrilic halide polymers. 4,551,317, Cl. 423-300.000.

Liberti, Paul A.; and Pollara, Paul, to Immunicon, Inc. Selective removal of immunospecifically recognizable substances from solution. 4,551,435, Cl. 436-541.000.

LiCausi, Joseph: *See*—
Kurtz, Robert J.; and LiCausi, Joseph, 4,550,722, Cl. 128-80.00A.

Licinvest AG: *See*—
Ackeret, Peter, 4,550,516, Cl. 40-513.000.

Liebl, Helmut, to Max-Planck-Gesellschaft zur Furderung der Wissenschaften e.V. Combined electrostatic objective and emission lens. 4,551,599, Cl. 250-396.00R.

Lienard, Jean-Claude, to U.S. Philips Corporation. Method and system for communicating over an open communication network. 4,551,834, Cl. 370-94.000.

Lim, Wah L.: *See*—
Callaghan, Stephen P.; Callaghan, Timothy J.; Gustafson, Harry A.; and Lim, Wah L., 4,551,021, Cl. 356-350.000.

Lin, Fan-Nan; and Pennella, Filippo, to Phillips Petroleum Company. Catalyst for alcohol synthesis. 4,551,444, Cl. 502-313.000.

Lin, Frank W.: *See*—
Wong, Harvey C.; and Lin, Frank W., 4,551,664, Cl. 318-592.000.

Lincoln Electric Company, The: *See*—
Amata, Mario A., 4,551,610, Cl. 219-146.300.

Linde Aktiengesellschaft: *See*—
Morper, Manfred; and Fuchs, Uwe, 4,551,250, Cl. 210-603.000.

Lindgren, Peter B. Liquid level gauge. 4,550,600, Cl. 73-299.000.

Lininger, Michael A., to Owens-Illinois, Inc. Tamper resistant closure with tear-off band. 4,550,844, Cl. 215-252.000.

Link, Howard D., to Norton Christensen, Inc. Diamond rotating bit. 4,550,790, Cl. 175-329.000.

Linnebach, Richard: *See*—
Schemmel, Gerald; and Linnebach, Richard, 4,551,186, Cl. 148-171.000.

Lischke, Burkhard; and Plies, Erich, to Siemens Aktiengesellschaft. Spectrometer objective for particle beam measurement technique. 4,551,625, Cl. 250-310.000.

Liss, Bernard S.: *See*—
Liss, Saul; and Liss, Bernard S., 4,550,733, Cl. 128-421.000.

Liss, Saul; and Liss, Bernard S., to Pain Suppression Labs, Inc. Electronic dental analgesia apparatus and methodology. 4,550,733, Cl. 128-421.000.

Litton Systems, Inc.: *See*—
Ross, William E., 4,550,983, Cl. 350-376.000.

Liu, John J., to Du Pont de Nemours, E. I., and Company. Process for preparing rimantadine. 4,551,552, Cl. 564-448.000.

Liu, Michael S.: *See*—
Betsch, Regis J.; Liu, Michael S.; and Tufte, Obert N., 4,551,394, Cl. 428-641.000.

Lloyd, Kenneth, to D.A.B. Industries, Inc. Bearing materials. 4,551,395, Cl. 428-677.000.

Lloyd, Owen: *See*—
Cox, Anthony F.; Glanville, Roger; Lloyd, Owen; and Robbins, Keith V., 4,550,591, Cl. 73-28.000.

Lockheed Electronics Company, Inc.: *See*—
Dow, John, Jr.; Oetting, William A.; and Yessian, Richard J., 4,550,859, Cl. 222-26.000.

Loesch, Robert P., to AT&T Technologies, Inc. Methods of and apparatus for making retractile cords. 4,551,185, Cl. 148-150.000.

Lohmeijer, Johannes H. G. M., to General Electric Company. Antistatic polyphenylene ether compositions. 4,551,494, Cl. 524-89.000.

Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith M., to Union Carbide Corporation. Conversion processes with titanium-containing molecular sieves. 4,551,236, Cl. 208-112.000.

Loktionova, Lidia Y.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.

Longmore, Paul H.: *See*—
Goegelein, Gerald W.; Longmore, Paul H.; and Fisher, Stan E., 4,551,837, Cl. 371-25.000.

Longo, Walter G., to Nuova Faema S.p.A. Espresso coffee machine control system displaying boiler temperature and pressure. 4,551,611, Cl. 219-308.000.

Lopez, Benjamin L.: *See*—
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., 4,551,719, Cl. 340-825.360.

Lord Corporation: *See*—
Hsich, Henry S. Y.; and Ambrose, Richard J., 4,551,807, Cl. 364-473.000.

Lorenz, Jurgen W., to Georg Wagner KG. Sterilizer container. 4,551,311, Cl. 422-300.000.

Louvel, Bernard: *See*—
Botrel, Jose ; Harari, Sami; Briere, Joseph; and Louvel, Bernard, 4,551,839, Cl. 371-35.000.

Lovell, Walter: *See*—
Koenig, Robert H.; and Lovell, Walter, 4,551,595, Cl. 200-86.00R.

Lowe, Richard S.: *See*—
Vella, Paul J.; Garel-Jones, Philip M.; and Lowe, Richard S., 4,551,019, Cl. 356-73.100.

Lu, James W. B. Inclined radially louvered fin heat exchanger. 4,550,776, Cl. 165-151.000.

Lucas Industries public limited company: *See*—
Price, Anthony G.; and Campbell, Roy, 4,550,810, Cl. 188-71.400.

Luckfiel, Karl-Heinz: *See*—
Tamm, Franz; Horicke, Bernhard; Welfle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, 4,551,183, Cl. 148-12.00R.

Ludlow Industries, Inc.: *See*—
Gruber, George E., 4,551,663, Cl. 318-482.000.

Lukens, Fred E., to United States of America, National Aeronautics and Space Administration. Amplifier for measuring low-level signals in the presence of high common mode voltage. 4,551,687, Cl. 330-258.000.

Lummus Industries, Inc.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,550,657, Cl. 100-43.000.

Lundahl, E. Cordell; Wiser, James G.; Thornley, W. Ray; and Jensen, Laurel H., to Ezra C. Lundahl, Inc. Crop processor. 4,550,554, Cl. 56-294.000.

Luoma, Eugene H.: *See*—
Schmit, Justin M.; and Luoma, Eugene H., 4,551,337, Cl. 426-94.000.

Luukkala, Mauri; and Lehto, Ari. Procedure and means for examining the surface quality of materials in solid state. 4,551,030, Cl. 374-5.000.

Lynch, Henry W.: *See*—
Finney, Roy P.; Trick, Robert E.; and Lynch, Henry W., 4,550,719, Cl. 128-79.000.

Lynch, India M. Tire changing rack. 4,550,835, Cl. 211-24.000.

Lynn, Merrill: *See*—
Gardner, Robert W.; Guile, Donald L.; and Lynn, Merrill, 4,551,295, Cl. 264-177.00R.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, 4,551,328, Cl. 423-607.000.

M & W Gear Company: *See*—
Meiners, Elmo R., 4,550,556, Cl. 56-341.000.

Maag Gear-Wheel and Machine Company Limited: *See*—
Spaeth, Hans, 4,550,508, Cl. 33-179.50C.

Maan, Cornelis: *See*—
Compen, Johannes M. A. A.; and Maan, Cornelis, 4,551,652, Cl. 313-466.000.

Macander, Rudolph F.: *See*—
Herberg, Michael J.; Macander, Rudolph F.; and Stegman, Todd R., 4,551,515, Cl. 528-18.000.

MacDonald, Scott A.: *See*—
Hult, Anders; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,551,418, Cl. 430-325.000.

Machida, Yukihiko; Nakano, Kenji; and Takahashi, Takao, to Sony Corporation. Method and apparatus for recording digital information in alternate recording tracks. 4,551,771, Cl. 360-19.100.

MacIsaac, William L. Vehicle suspension system. 4,550,926, Cl. 280-112.00A.

Macovski, Albert. Selective region NMR projection imaging system. 4,551,680, Cl. 324-309.000.

Maeda, Katsuya: *See*—
Suzuki, Atsushi; Ninomiya, Masakazu; Maeda, Katsuya; and Kawashima, Yutaka, 4,550,701, Cl. 123-436.000.

Maeda Metal Industries Ltd.: *See*—
Fujita, Masahiro; and Uemura, Yukio, 4,550,633, Cl. 81-56.000.

Maeda, Osamitsu: *See*—
Shimamura, Hayato; and Maeda, Osamitsu, 4,550,751, Cl. 138-93.000.

Maeno, Tsuyoshi: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichiro; Ohtsuka, Mitsugi; and Maeno, Tsuyoshi, 4,551,722, Cl. 340-904.000.

Magnegic Peripherals: *See*—
Ericson, Charles P.; and Shadzi, Bahram, 4,551,355, Cl. 427-48.000.

Mahawili, Imad, to Genus, Inc. Cooled optical window for semiconductor wafer heating. 4,550,684, Cl. 118-724.000.

Maher, Robert J.; and Tooson, Ronald, to Douthitt Corporation. Vacuum printer. 4,551,016, Cl. 355-91.000.

Mahon, Joseph J., to Eaton Corporation. Appliance control and programmer timer therefor. 4,551,590, Cl. 200-38.00R.

Mahoney, Thomas P.: *See*—
Campbell, James R., 4,551,604, Cl. 219-78.120.

Mai, Khuong H. X.; and Patil, Ghanshyam, to American Hospital Supply Corporation. Synthesis of alpha-aminonitriles. 4,551,526, Cl. 544-163.000.

Mai, Khuong H. X.; and Patil, Ghanshyam, to American Hospital Supply Corporation. Synthesis of alpha-aminonitriles. 4,551,537, Cl. 546-330.000.

Maida, Osamu: *See*—
Ishizaka, Sunao; and Maida, Osamu, 4,550,991, Cl. 354-21.000.

Maier, Alfred E., to Westinghouse Electric Corp. Molded case circuit breaker with adjustable stationary lower electrical contact. 4,551,597, Cl. 200-249.000.

Maiese, William M.: *See*—
Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., 4,551,533, Cl. 546-35.000.

Maietta, Michael G.: *See*—
Sutryn, Caroll S.; and Maietta, Michael G., 4,550,825, Cl. 206-222.000.

Makhteshim Chemical Works, Ltd.: *See*—
Bracha, Peretz; and Massil, Solomon, 4,551,458, Cl. 514-259.000.

Maki, Masakazu: *See*—
Iizuka, Eiichi; Sando, Tomoji; Kashima, Shinji; and Maki, Masakazu, 4,551,195, Cl. 156-603.000.

Makino, Osamu: *See*—
Eda, Kazuo; Kikuchi, Yasuharu; Makino, Osamu; and Matsuoka, Michio, 4,551,268, Cl. 252-519.000.

Malcosky, Norman D.; and Koziar, Greg, to Columbia Gas System Service Corporation. Gas tracer composition and method. 4,551,154, Cl. 48-193.000.

Maldonado, Juan R.: *See*—
Di Milia, Vincent; Maldonado, Juan R.; Speidell, James L.; and Warlaumont, John M., 4,551,192, Cl. 156-345.000.

Mallinckrodt, Inc.: *See*—
Inskip, Ervin B., 4,551,551, Cl. 564-430.000.

Manabe, Katsuhide; and Tsutsui, Masatoshi, to Toyoda Gosei Kabushiki Kaisha. Colored resinous articles with concealed metallic luster. 4,551,387, Cl. 428-336.000.

Manders, Petrus G. J., to Ruti-te Strake B.V. Method for conveying a flexible thread by means of pressurized gas. 4,550,752, Cl. 139-435.000.

Mandl, Joseph P., to Medex, Inc. Pressure infusor. 4,551,136, Cl. 604-141.000.

Manis, Paul A.: *See*—
Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., 4,551,350, Cl. 427-389.900.

Manitowoc Company, Inc., The: *See*—
Schulze-Berge, Carl J., 4,550,572, Cl. 62-138.000.

Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., to General Electric Co.; and Rensselaer Polytechnic Institute. Laser doppler velocimeter for measuring torsional vibration. 4,551,017, Cl. 356-28.500.

Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., to General Electric Co.; and Rensselaer Polytechnic Institute. Acoustic emission analyzer. 4,551,018, Cl. 356-28.500.

Mannesmann Aktiengesellschaft: *See*—
Bitsch, Harald; Donner, Klaus; Hasselmann, Heinz; and Horbach, Rainer, 4,550,664, Cl. 105-180.000.
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.

Manning, Maurice; and Sawyer, Wilbur H., to Medical College of Ohio, The; and Columbia University, The Trustees of. Derivatives of arginine vasopressin antagonists. 4,551,445, Cl. 514-9.000.

Mansfield, George F. Quick-loading device for muzzle-loading rifles. 4,550,517, Cl. 42-90.000.

Manville Service Corp.: *See*—
Hoke, Merle C.; Armstrong, Richard G.; and Penn, James E., 4,551,792, Cl. 362-362.000.

Marcantonio, Paul J., to Chevron Research Company. Recovering vanadium values from ammonium bicarbonate solution. 4,551,315, Cl. 423-67.000.

Marchand, William C. Gas turbine combustion system utilizing renewable and non-critical solid fuels with residue remover to minimize environmental pollution. 4,550,563, Cl. 60-39.060.

Marchetti, Augusto. Taping machine for cartons of variable width. 4,551,194, Cl. 156-468.000.

Marcinowski, Stefan: *See*—
Tschang, Chung-Ji; and Marcinowski, Stefan, 4,551,482, Cl. 521-53.000.

Marco Seattle, Inc.: *See*—
Hagedorn, Stanley R.; and Roach, Stewart W., 4,551,042, Cl. 406-93.000.

Marconi Avionics Limited: *See*—
Ellis, Stafford M., 4,550,836, Cl. 211-41.000.

Marcus, Bonita K.: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith M., 4,551,236, Cl. 208-112.000.

Mard, Kenneth C., to United Technologies Corporation. Fixed position, fixed frequency pendular-type vibration absorber with frequency linearization. 4,550,812, Cl. 188-379.000.

Marendaz, Georges-Andre , to Ateliers des Charmilles S.A. Apparatus and method for monitoring the machining conditions of an EDM apparatus. 4,551,809, Cl. 364-474.000.

Marfat, Anthony, to Pfizer Inc. Anti-inflammatory 2-methyl-2H-1,2-benzo-(or -thieno-)thiazine-3-carboxamide 1,1-dioxide derivatives, compositions, and method of use therefor. 4,551,452, Cl. 514-222.000.

Marghinotti, Daniele: *See*—
Canella, Marco; Marghinotti, Daniele; Bernardi, Adriano; and Sodini, Giancarlo, 4,551,335, Cl. 426-44.000.

Mariano, Kenneth E.; and Spector, George. Attic staircase. 4,550,534, Cl. 52-19.000.

Marion Laboratories, Inc.: *See*—
Plaas, Jon R.; Parker, Keith E.; Keiser, James D.; and Johnson, Elmer C., Jr., 4,551,139, Cl. 604-290.000.

Mark, Seymour, to Standard Oil Company, The. Coal-aqueous mixtures. 4,551,179, Cl. 106-277.000.

Markham, John D. Trackside-controlled electric railway systems. 4,551,659, Cl. 318-258.000.

Marks, Charles E., to Mobil Oil Corporation. Method and apparatus for pressure-cascade separation and stabilization of mixed phase hydrocarbonaceous products. 4,551,238, Cl. 208-340.000.

Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim. Preparation of zeolites. 4,551,321, Cl. 423-329.000.

Marotto, Robert A.: *See*—
Babb, John H., Jr.; and Marotto, Robert A., 4,550,939, Cl. 292-340.000.

Marple, Elwood: *See*—
Burke, William L., Sr.; Marple, Elwood; and Suisman, A. Eileen, 4,550,602, Cl. 73-428.000.

Marshall, Lloyd B.; and Ghebrid, Faycal, to Etudes et Fabrication Dowell Schlumberger. Quick-release coupling. 4,550,935, Cl. 285-18.000.

Marsili, Antonio, to Laboratori Baldacci SpA. 2-(ω-Alkylaminoalkyl)- and 2-(ω-dialkylaminoalkyl-3-(4-X-benzylidene)-phthalimidines. 4,551,453, Cl. 514-234.000.

Martens, Jurgen: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,551,548, Cl. 562-402.000.

Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., to SWS Silicones Corporation. Textile finishing with durable press resin composition. 4,551,350, Cl. 427-389.900.

Martin, George; and Brocksou, Robert H., to Eaton Corporation. Electrically controlled shift actuator. 4,550,625, Cl. 74-335.000.

Martin, Gerald L., to EER Products Inc. Heat exchanger. 4,550,773, Cl. 165-54.000.

Martin, James R., Sr.: *See*—
Aicher, Frederick T.; Martin, James R., Sr.; and Flanagan, William T., 4,550,961, Cl. 339-14.00R.

Martin, John H., to Energy Cycle, Inc. Anaerobic digester. 4,551,243, Cl. 210-180.000.

Martorana, Piero A.: *See*—
Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,551,454, Cl. 514-252.000.

Maruhashi, Yoshitsugu; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Composite vessel excellent in preservability and process for preparation thereof. 4,551,366, Cl. 428-35.000.

Maruta, Keiichi; and Yuyama, Yukihiro, to Ricoh Company, Ltd. Thermosensitive recording material. 4,551,738, Cl. 346-200.000.

Maruyama, Takashi, to Chinon Kabushiki Kaisha. Focusing control device. 4,550,994, Cl. 354-402.000.

Marvin Glass & Associates: *See*—
Ferris, Michael J.; and Breslow, Jeffrey D., 4,550,917, Cl. 273-246.000.
Hanson, Steven P., 4,551,109, Cl. 446-95.000.
Kulesza, Ralph J.; Rosenwinkel, Donald A.; and Disko, Harry, 4,550,876, Cl. 239-211.000.

Marzocchi, Alfred: *See*—
Grossi, Anthony V.; Hahn, Louis T.; and Marzocchi, Alfred, 4,551,178, Cl. 106-273.00N.

Mascitti, Albert A.: *See*—
Sulkowski, Theodore S.; Silver, Paul J.; Mascitti, Albert A.; and Bender, Reinhold H. W., 4,551,534, Cl. 546-123.000.

Maslak, Samuel H.; and Wright, John N., to Acuson. Phased array acoustic imaging system. 4,550,607, Cl. 73-626.000.

Mason, Charles W. Attachment of Herbst mechanism to maxillary arch. 4,551,095, Cl. 433-19.000.

Massil, Solomon: *See*—
Bracha, Peretz; and Massil, Solomon, 4,551,458, Cl. 514-259.000.

Masunaga, Makoto; and Kinoshita, Takao, to Canon Kabushiki Kaisha. Image pick-up device and system. 4,551,758, Cl. 358-213.000.

Masuyama, Kenichi: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, 4,551,386, Cl. 428-323.000.

Materazzi, Mario: *See*—
De Luca, Giovanna; Di Stazio, Giovanni; Politi, Vincenzo; and Materazzi, Mario, 4,551,471, Cl. 514-419.000.

Matheson, Frederick A.: *See*—
Gurr, George P.; and Matheson, Frederick A., 4,551,812, Cl. 364-492.000.

Mathew, Chempolil T.; and Ulmer, Harry E., to Allied Corporation. Preparation of alcoholic hydroxylamine solution from hydroxylammonium sulfate. 4,551,323, Cl. 423-387.000.

Mathew, Chempolil T.; and Ulmer, Harry E., to Allied Corporation. Preparation from hydroxylammonium sulfate of other hydroxylammonium salts via alcoholic hydroxylamine. 4,551,324, Cl. 423-387.000.

Mathiasen, Herluf S., to Bang & Olufsen A/S. Earphone set. 4,551,584, Cl. 179-156.00R.

Mathieu, Bernd; and Weber, Wolfram, to Fresenius AG. Apparatus for running off liquids from sealed vessels. 4,551,147, Cl. 604-405.000.

Mathieu, Julien C., to Dayco Corporation. Method of making brake system assembly for railway vehicle. 4,550,484, Cl. 29-434.000.

Matsuda, Kouichi; and Sato, Youichi, to Pioneer Electronic Corporation. Television bandwidth correcting system. 4,551,755, Cl. 358-188.000.

Matsumoto, Eiichi: *See*—
Kikuchi, Yasuyuki; Matsumoto, Eiichi; and Tanaka, Yoshimasa, 4,550,695, Cl. 123-41.120.

Matsumoto, Hiroshi: *See*—
Sanbayashi, Takeshi; and Matsumoto, Hiroshi, 4,551,813, Cl. 364-569.000.

Matsumoto, Masakazu: *See*—
Kaneko, Kenkichi; Hattori, Takeshi; Hakamata, Kensaku; Hayashi, Satoru; Goshima, Takayuki; and Matsumoto, Masakazu, 4,550,638, Cl. 84-431.000.

Matsumoto, Masanori: *See*—
Moriguchi, Hiroyuki; Matsumoto, Masanori; Nishiwaki, Akira; Morohoshi, Yasuo; and Nomori, Hiroyuki, 4,551,303, Cl. 420-590.000.

Matsumoto, Mitsuo; Hirai, Koji; Yoshimura, Noriaki; and Okamura, Takayuki, to Kuraray Co., Ltd. Process for production of polyurethane. 4,551,518, Cl. 528-80.000.

Matsuo, Kenji; and Abou, Shouji, to Tokyo Shibaura Denki Kabushiki Kaisha. Switched capacitor filter circuit. 4,551,683, Cl. 328-167.000.

Matsuo, Nobuo, to Nitsuko Limited. Circuit for automatically releasing holding state of telephone system. 4,551,582, Cl. 179-81.00R.

Matsuoka, Michio: *See*—
Eda, Kazuo; Kikuchi, Yasuharu; Makino, Osamu; and Matsuoka, Michio, 4,551,268, Cl. 252-519.000.

Matsushima, Noboru, to Nippon Oil Seal Industry Co., Ltd. Oil seal with main lip, subsidiary lip and dust lip. 4,550,920, Cl. 277-134.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Eda, Kazuo; Kikuchi, Yasuharu; Makino, Osamu; and Matsuoka, Michio, 4,551,268, Cl. 252-519.000.
Miyagawa, Junichi; and Hirai, Yukio, 4,551,600, Cl. 219-10.49R.
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, 4,551,757, Cl. 358-212.000.
Tsuchiya, Hiroyoshi; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Otsuka, Hirotaka, 4,551,768, Cl. 358-283.000.

Matsushita Electric Works, Ltd.: *See*—
Akiyama, Shoichi; and Kondo, Mikio, 4,551,711, Cl. 340-567.000.
Takasaki, Shuichi, 4,551,579, Cl. 174-88.00R.
Wada, Sumio; and Inakagata, Satoru, 4,551,666, Cl. 320-20.000.

Matsuura, Hiromi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Dynamic RAM integrated circuit device. 4,551,820, Cl. 365-189.000.

Mattel, Inc.: *See*—
Rich, Hubert A.; Saffer, Gary M.; and Sestito, William F., 4,551,127, Cl. 493-462.000.

Mattle, Hans P., to International Standard Electric Corporation. Measuring head for determining the color purity and the convergence in a color picture tube. 4,551,748, Cl. 358-10.000.

Mauri Brothers & Thomson (Aust.) Pty. Limited: *See*—
Zentner, Harry, 4,551,334, Cl. 426-26.000.

Max-Planck-Gesellschaft zur Furderung der Wissenschaften e.V.: *See*—
Liebl, Helmut, 4,551,599, Cl. 250-396.00R.

Max-Planck-Gesellshaft zur Forderung der Wissenschaften e.V.: *See*—
Asmussen, Frithjof; Sotobayashi, Hideto; Chen, Jiang-Tsun; and Schnabel, Wolfram, 4,551,414, Cl. 430-270.000.

Maxcap, Inc.: *See*—
Nolan, Robert L., 4,550,843, Cl. 215-252.000.

Mayer, Karl: *See*—
Zimmer, Johannes; and Mayer, Karl, 4,550,681, Cl. 118-410.000.

Mayo Foundation: *See*—
Gilbert, Barry K.; and Schwab, Daniel J., 4,551,746, Cl. 357-74.000.
Gilbert, Barry K.; and Schwab, Daniel J., 4,551,747, Cl. 357-74.000.

Mazzawy, Robert S.: *See*—
Callahan, David J.; Mazzawy, Robert S.; Stryker, Howard Y.; and Kelly, James B., 4,550,564, Cl. 60-39.093.

McAuliffe, Gerald N., to Outboard Marine Corporation. Gas controlled battery charging system using a gas detector. 4,551,667, Cl. 320-46.000.

McCallister, John. Golf club head with visual swing-directing cues. 4,550,914, Cl. 273-183.00D.

McConnell, Richard L.; Cox, Abraham J.; and Darnell, William R., to Eastman Kodak Company. Low-melting copolyester adhesives. 4,551,521, Cl. 528-302.000.

McCulloch Corporation: *See*—
Ruzicka, Alan V., 4,550,499, Cl. 30-276.000.

McDonald, John F.: *See*—
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,017, Cl. 356-28.500.
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,018, Cl. 356-28.500.

McDonald, William E., II. Modular water heater connection apparatus and method for fabricating same. 4,550,710, Cl. 126-362.000.

McDonnell Douglas Corporation: *See*—
Grossman, Jack J., 4,551,628, Cl. 250-503.100.

McDonough, Stephen L. Boat dolly. 4,550,925, Cl. 280-47.13B.

McEwen, James A. Method and apparatus for detection of breathing gas interruptions. 4,550,726, Cl. 128-202.220.

McFarlane, Glenton P.; and Swift, Steven G., to Johnson Matthey plc. Bursting disc orientation device. 4,550,743, Cl. 137-68.100.

McGraw-Edison Company: *See*—
Juve, Robert J.; and Eagen, Michael J., 4,550,682, Cl. 118-425.000.

McIntyre, John: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and Rogers, Charles J., 4,551,218, Cl. 204-240.000.

McMullen, Carl R.; and Campbell, Marshall S., to Foundry Technology, Inc. Compactability measurement method and apparatus for sand casting. 4,550,768, Cl. 164-456.000.

McNeil, Charles B., to Surgidyne Inc. Method and apparatus for removing liquids from a drainage device. 4,551,141, Cl. 604-317.000.

McTamaney, Louis S.; Bisbee, Gary W.; Kettlety, Robert W.; and Konsevich, James L., to FMC Corporation. Method and apparatus for entering control points relative to a dynagraph of a well pumping unit. 4,551,730, Cl. 346-33.0WL.

McWade, Duncan R. Fuel supply system for internal combustion engines. 4,550,691, Cl. 123-3.000.

Mead Corporation, The: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,551,407, Cl. 430-138.000.

Mechatron Systems, Inc.: *See*—
Wong, Harvey C.; and Lin, Frank W., 4,551,664, Cl. 318-592.000.

Medex, Inc.: *See*—
Mandl, Joseph P., 4,551,136, Cl. 604-141.000.

Medical College of Ohio, The: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,551,445, Cl. 514-9.000.

Medical Engineering Corporation: *See*—
Finney, Roy P.; Trick, Robert E.; and Lynch, Henry W., 4,550,719, Cl. 128-79.000.
Trick, Robert E., 4,550,720, Cl. 128-79.000.

Medical Research Associates, Ltd. #2: *See*—
Rexroth, Frederick W., 4,550,727, Cl. 128-303.140.

Meeder, Edward A., Jr., to Allied Corporation. Cathode ray tube vibration isolator. 4,551,765, Cl. 358-248.000.

Meffert, Alfred: *See*—
Herold, Julius; Kluth, Hermann; Meffert, Alfred; and Leder, Manfred, 4,551,517, Cl. 528-60.000.

Meguro, Toshiaki: *See*—
Ogawa, Masumi; Kawakami, Hiromi; and Meguro, Toshiaki, 4,551,756, Cl. 358-197.000.

Mehnert, Walter. Method and apparatus for the measurement of the length of a straight line or an arc. 4,550,504, Cl. 33-125.00C.

Mehra-Palta, Asha; and Gross, Kimnaja, to International Paper Company. Asexual propagation of pine trees. 4,550,528, Cl. 47-58.000.

Meier, Hans-Jurgen, to Carl-Zeiss-Stiftung. Testing apparatus including a vacuum-tight radiation window. 4,550,979, Cl. 350-321.000.

Meier, Jacques, to Ferag AG. Apparatus for transporting flat products, especially printed products arriving in an imbricated formation. 4,550,822, Cl. 198-461.000.

Meiners, Elmo R., to M & W Gear Company. System for injection of liquid or granular material into a round hay bale. 4,550,556, Cl. 56-341.000.

Meinzer, Karl. Method and device for displaying graphic information, in particular for braille reading. 4,551,102, Cl. 434-114.000.

Meise, William H.; and Dischert, Robert A., to RCA Corporation. Compatible wide-screen color television system. 4,551,754, Cl. 358-180.000.

Meli, Alberto: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, 4,551,451, Cl. 514-217.000.

Melillo, Anthony; and Gabriele, Louis. Exercising appliance. 4,550,907, Cl. 272-93.000.

Mellema, Sybe J., to U.S. Philips Corporation. Road illumination luminaire for pole-mounting. 4,551,793, Cl. 362-370.000.

Memminger GmbH: *See*—
Kuhn, Falk; and Buck, Alfred, 4,550,577, Cl. 66-104.000.

Menges, John R.: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,550,729, Cl. 128-325.000.

Merchant, Kamal; and Schmitt, Claude, to Siemens Aktiengesellschaft. Integrable digital/analog converter. 4,551,709, Cl. 340-347.0DA.

Merchant, Philip; and Lacy, Sylvia M., to Exxon Research & Engineering Co. Water based demulsifier formulation and process for its use in dewatering and desalting crude hydrocarbon oils. 4,551,239, Cl. 208-188.000.

Merck & Co., Inc.: *See*—
Katz, Irving M., 4,551,456, Cl. 514-254.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, 4,551,264, Cl. 252-299.620.

Mericle, Robert W.: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,550,729, Cl. 128-325.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Bey, Philippe, 4,551,550, Cl. 564-215.000.

Merten, Rudolf: *See*—
Schellhammer, Karl-Wolfgang; Rottmaier, Ludwig; Merten, Rudolf; and Schimmel, Ulrich, 4,551,263, Cl. 252-186.390.

Mesch, William G.: *See*—
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., 4,551,719, Cl. 340-825.360.

Messick, George H., Jr.: *See*—
Fletcher, George R., Jr.; Messick, George H., Jr.; Roby, Charles K.; and Huey, Cecil O., Jr., 4,550,532, Cl. 51-288.000.

Messing, Horst, to Mr. Wash Auto-Service AG. Device for cleaning the wheels particularly the rims of a vehicle in a carwash. 4,550,464, Cl. 15-53.00B.

Metallgesellschaft Aktiengesellschaft: *See*—
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.

Metropolitan Wire Corporation: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,550,956, Cl. 312-250.000.

Metz, Arthur J., to Tektronix, Inc. Oscilloscope having dual time base system for accurate differential time measurement. 4,551,656, Cl. 315-392.000.

Meyer, William D. Game with triangular shaped playing elements. 4,550,915, Cl. 273-272.000.

Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, to Ciba Geigy Corporation. 4-Difluoromethoxy-2-aminopyrimidines. 4,551,531, Cl. 544-320.000.

Meyers, Grahame A. Safe having concealed hinges. 4,550,667, Cl. 109-70.000.

Meynard, Paul: *See*—
Fournier, Jean; Patron, Henri; and Meynard, Paul, 4,550,777, Cl. 165-162.000.

Michaud, Horst: *See*—
Behnke, Horst; Michaud, Horst; Seeholzer, Joseph; and Solansky, Svatoplug, 4,551,166, Cl. 71-30.000.

Michel, Lorraine M. Foot support. 4,550,721, Cl. 128-80.00E.

Michel, Thomas J.: *See*—
Harris, Joan; and Michel, Thomas J., 4,551,329, Cl. 424-22.000.

Michelfelder, Sigfrid: *See*—
Leikert, Klaus; Buttner, Gerhard; and Michelfelder, Sigfrid, 4,551,090, Cl. 431-188.000.

Michl, Josef; and Puebla-Ponce, Claudio G., to University of Utah. Optical recording method and apparatus utilizing polymeric birefringent materials. 4,551,819, Cl. 365-120.000.

Middleton, Michael L.: *See*—
Elam, Edward U.; and Middleton, Michael L., 4,551,523, Cl. 536-119.000.

Mikami, Tomoki: *See*—
Yaguchi, Masachika; Mikami, Tomoki; and Hase, Takashi, 4,551,397, Cl. 428-691.000.

Miles, Clive; and Schneiderman, Gary, to Thoratec Laboratories Corporation. Autotransfusion system with anticoagulant delivery system. 4,551,131, Cl. 604-31.000.

Miles Laboratories, Inc.: *See*—
Bouwman, Dale W.; and Clayborn, Harold K., 4,551,306, Cl. 422-56.000.

Milford, George N., Jr., to Du Pont de Nemours, E. I., and Company. Preparation and use of nitroterephthalamic acids. 4,551,549, Cl. 562-437.000.

Miller, Alan H.: *See*—
Swartz, Henry D.; and Miller, Alan H., 4,550,798, Cl. 181-201.000.

Miller, Gabriel L., to AT&T Bell Laboratories. Noncontacting conductivity type determination and surface state spectroscopy of semiconductor materials. 4,551,674, Cl. 324-158.00R.

Miller, Gary; Jobes, Sam S.; and Benfey, David P., to General Electric Company. Format reconfigurable CRT display. 4,551,657, Cl. 315-399.000.

Miller, Jeffrey T.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Process for reacting aromatic compounds. 4,551,572, Cl. 585-454.000.

Miller, John E., to Dresser Industries, Inc. Method and arrangement for retaining cylinder liners in a reciprocating pump. 4,550,646, Cl. 92-128.000.

Miller, R. Craig, to Miller, R. Craig; and Pro/Pak Industries, Inc., a part interest. Continuous filter screen system for removing particles from a liquid. 4,551,255, Cl. 210-770.000.

Miller, Robert E.; and Vervacke, Steven L., to Appleton Papers Inc. Record member. 4,551,739, Cl. 346-216.000.

Miller, Stephen J., to Chevron Research Company. Oligomerization of liquid olefin over a nickel-containing silicaceous crystalline molecular sieve and hydrocarbyl aluminum halide. 4,551,438, Cl. 502-62.000.

Minakata, Matsuo: *See—*
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,550,578, Cl. 68-5.00E.

Mindlin, Richard B.: *See—*
Haynes, Joel, 4,550,651, Cl. 99-279.000.

Minnesota Mining and Manufacturing Company: *See—*
Bell, Vivien L., 4,551,413, Cl. 430-270.000.
Carey, Patrick H., Jr., 4,551,378, Cl. 428-198.000.
Chung, Chi H., 4,551,828, Cl. 369-275.000.

Mino, Hisashi; and Iizima, Takeshi, to Sanyo-Kokusaku Pulp Co., Ltd. Color image forming method and color image forming photo-sensitive material to be used therefor. 4,551,408, Cl. 430-141.000.

Minolta Camera Kabushiki Kaisha: *See—*
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,550,993, Cl. 354-402.000.
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.
Yuasa, Yoshio; Yasumoto, Hidetoshi; Kawagoe, Nobukazu; Naruse, Kazuhiko; and Inaba, Masahito, 4,551,011, Cl. 355-35.000.

Mintz, Michael D., to International Technidyne Corp. Apparatus for analyzing the influence of additive reagents upon the coagulation of blood and related methods. 4,551,308, Cl. 422-58.000.

Mirto, Nicholas. Snow remover for automobiles and the like. 4,550,943, Cl. 294-54.500.

Mr. Wash Auto-Service AG: *See—*
Messing, Horst, 4,550,464, Cl. 15-53.00B.

Misumi, Teruo: *See—*
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,551,405, Cl. 430-64.000.

Misuzu Machineries & Engineering Ltd.: *See—*
Shimamura, Hayato; and Maeda, Osamitsu, 4,550,751, Cl. 138-93.000.

Mita Industrial Co., Ltd.: *See—*
Hayashi, Kiyoshi, 4,550,985, Cl. 350-6.300.
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,551,403, Cl. 430-58.000.
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, 4,551,009, Cl. 355-15.000.
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.

Mitchell, Andrew: *See—*
Sullivan, Dale W.; Janssen, Kermit W.; and Mitchell, Andrew, 4,550,778, Cl. 166-234.000.

Mitchell, Brian: *See—*
Riches, Arthur J.; and Mitchell, Brian, 4,550,967, Cl. 339-88.00R.

Mitsubishi Chemical Industries Limited: *See—*
Takahashi, Kiyoshi; Konagai, Makoto; Yoshitomi, Toshihiko; and Omori, Takeshi, 4,551,575, Cl. 136-255.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Fukada, Koichi; and Sugimoto, Hiroshi, 4,550,603, Cl. 73-587.000.
Shimoda, Michio; and Watanabe, Fumio, 4,551,805, Cl. 364-469.000.
Shimotori, Kazuhiro; and Ozaki, Hideyuki, 4,551,741, Cl. 357-23.600.
Sugimoto, Hiroshi; and Fukada, Koichi, 4,550,604, Cl. 73-587.000.
Taniguti, Ryosuke, 4,551,811, Cl. 364-481.000.

Mitsubishi Mining & Cement Co., Ltd.: *See—*
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, 4,551,571, Cl. 585-440.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Inoue, Masao; and Suzuki, Shingo, 4,550,977, Cl. 350-128.000.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Imada, Nobuyuki; and Okada, Toshiteru, 4,551,254, Cl. 210-688.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, 4,551,478, Cl. 514-603.000.

Mittal, Faquir C.; and Solis, Charles R., to Sperry Corporation. Apparatus for use in cooling integrated circuit chips. 4,551,787, Cl. 361-387.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Nishikata, Goro, 4,550,507, Cl. 33-164.00R.

Miya, Shinya: *See—*
Harada, Masato; Miya, Shinya; Yamada, Sadahiko; and Iijima, Makoto, 4,551,439, Cl. 502-107.000.

Miyagawa, Junichi; and Hirai, Yukio, to Matsushita Electric Industrial Co., Ltd. Ventilated cooking appliance unit. 4,551,600, Cl. 219-10.49R.

Miyahara, Kingo, to Dowa Company, Ltd. Evaporation burner. 4,551,089, Cl. 431-116.000.

Miyajima, Mikio: *See—*
Koike, Hiroshi; Takeuchi, Shuhei; and Miyajima, Mikio, 4,551,033, Cl. 400-308.000.

Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, to Mita Industrial Co., Ltd. Photosensitive material for electrophotography. 4,551,403, Cl. 430-58.000.

Miyake, Hideo: *See—*
Sakamoto, Junichi; Fujimoto, Hiroshi; and Miyake, Hideo, 4,551,215, Cl. 204-159.230.

Miyanaka, Masaki: *See—*
Okubo, Takeshi; Kodachi, Hideo; and Miyanaka, Masaki, 4,550,488, Cl. 29-568.000.

Miyao, Masanobu: *See—*
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.

Miyasaka, Kingo: *See—*
Sumiyoshi, Kikuo; Sato, Eiji; Hirai, Kazuo; Miyasaka, Kingo; and Izumi, Masayoshi, 4,551,393, Cl. 428-609.000.

Miyashita, Kiyoshi; Ozeki, Fumitaka; and Tsuda, Hiroshi, to Olympus Optical Co., Ltd. Original conveying apparatus for electrophotographic copying machines. 4,551,010, Cl. 355-25.000.

Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, to UBE Industries, Ltd. Process for the production of ethylene glycol and/or glycollic acid esters, and catalyst therefor. 4,551,565, Cl. 568-864.000.

Mizell, James A. Method of fabricating hollow plastic objects and apparatus therefor. 4,551,290, Cl. 264-46.600.

Mizuno, Takao: *See—*
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, 4,551,082, Cl. 418-55.000.

Mizutani, Morikazu: *See—*
Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, 4,551,000, Cl. 355-3.00R.

Mizutani, Yasukazu: *See—*
Ubukata, Susumu; and Mizutani, Yasukazu, 4,551,701, Cl. 337-97.000.

Mobay Chemical Corporation: *See—*
Yeater, Robert P.; Pantone, Richard S.; and Rieck, James N., 4,551,498, Cl. 524-424.000.

Mobeck, William L.: *See—*
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., 4,551,719, Cl. 340-825.360.

Mobil Oil Corporation: *See—*
Braid, Milton, deceased, 4,551,259, Cl. 252-48.200.
Horodysky, Andrew G., 4,551,257, Cl. 252-32.70E.
Marks, Charles E., 4,551,238, Cl. 208-340.000.
Ramella, Amilcare; and Wang, Hsin-Ju, 4,551,228, Cl. 208-65.000.
Rohn, Charles L., 4,551,514, Cl. 526-348.100.

Mocella, Michael T.: *See—*
Taylor, Paul D.; and Mocella, Michael T., 4,551,553, Cl. 568-311.000.

Moore, Bernard S., to Pfizer Inc. Regeneration of 6-fluoro-4-chromanone from 6-fluoro-4-ureidochroman-4-carboxylic acid. 4,551,542, Cl. 549-401.000.

Moore, Donald W.; and Verstraete, Rick A., to Aerojet-General Corporation. Functionally redundant logic network architectures. 4,551,814, Cl. 364-716.000.

Moore, Donald W.; and Verstraete, Rick A., to Aerojet-General Corporation. Functionally redundant logic network architectures with logic selection means. 4,551,815, Cl. 364-716.000.

Moore, Kenneth P., to Xerox Corporation. Sheet feeding apparatus and valve therefor. 4,550,903, Cl. 271-98.000.

Moore, Lawrence F. Ocular dispenser. 4,550,866, Cl. 222-420.000.

Moore, William H. Mold coating. 4,550,761, Cl. 164-14.000.

Moores, Robert G., Jr.; Sides, Daniel H.; and Burnside, Howard L., to Black & Decker Inc. Orbital-action reciprocating power saw. 4,550,501, Cl. 30-393.000.

Moors, Johannes H., to U.S. Philips Corporation. Electrical connector. 4,550,963, Cl. 339-31.00R.

Moravnik, Zvi, to Solar Power Laboratories, Ltd. Solar water heating apparatus and solar concentrator useful therewith. 4,550,712, Cl. 126-439.000.

Moraw, Roland: *See—*
Schaedlich, Gunther; and Moraw, Roland, 4,551,406, Cl. 430-119.000.

Morgan, Tommie J.; and Willcott, M. Robert. Phantom for nuclear magnetic resonance machine. 4,551,678, Cl. 324-300.000.

Mori, Mikio: *See—*
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, 4,551,571, Cl. 585-440.000.

Mori, Takaro: *See—*
Fujii, Yasuhiko; Owaki, Isao; Saito, Susumu; Mori, Takaro; and Nakamura, Shinji, 4,551,840, Cl. 371-38.000.

Moriguchi, Hiroyuki; Matsumoto, Masanori; Nishiwaki, Akira; Morohoshi, Yasuo; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Method of using an evaporation source. 4,551,303, Cl. 420-590.000.

Morimoto, Takeshi: *See—*
Oda, Yoshio; and Morimoto, Takeshi, 4,551,220, Cl. 204-294.000.

Morinaka, Hideo: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Morinaka, Hideo; Nonaka, Yunji; and Nakanishi, Akira, 4,551,169, Cl. 71-94.000.

Morohoshi, Yasuo: *See*—
Moriguchi, Hiroyuki; Matsumoto, Masanori; Nishiwaki, Akira; Morohoshi, Yasuo; and Nomori, Hiroyuki, 4,551,303, Cl. 420-590.000.

Morper, Manfred; and Fuchs, Uwe, to Linde Aktiengesellschaft. Process for the anaerobic biological purification of wastewater. 4,551,250, Cl. 210-603.000.

Morris, Jeffrey D.; and Fuller, Robert A., to Cosden Technology, Inc. Apparatus for producing styrenic/alkenylnitrile copolymers. 4,551,309, Cl. 422-135.000.

Morris, Jeffrey D.; and Fuller, Robert A., to Cosden Technology, Inc. Process for producing styrenic/alkenylnitrile copolymers. 4,551,510, Cl. 526-68.000.

Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Polyesters of trans-4,4-stilbenedicarboxylic acid, terephthalic acid and 1,4-cyclohexanedimethanol. 4,551,520, Cl. 528-302.000.

Morrison, Ward D.: *See*—
Hibbard, George A.; and Morrison, Ward D., 4,550,785, Cl. 173-134.000.

Morton, Ted W. Live bait vending apparatus. 4,550,522, Cl. 43-55.000.

Moschensky, Anatoly D.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.

Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., to Eagle Machinery Company. Combination weighing system. 4,550,792, Cl. 177-25.000.

Mosher, Oren G.: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,550,792, Cl. 177-25.000.

Mosher, Ralph S., to Robotics, Inc. Low cost articulating/articulating and rotating wrist mechanism for automatic machine tool and automatic machine tool employing the same. 4,551,058, Cl. 414-735.000.

Mosier, John E.; Surjaatmadja, Jim B.; and Penn, Jack C., to Halliburton Company. Optical reader. 4,551,766, Cl. 358-256.000.

Motornetics Corporation: *See*—
Welburn, Ross D., 4,551,708, Cl. 340-347.0SY.

Motorola, Inc.: *See*—
Czarnocki, Wlodzimierz S., 4,550,611, Cl. 73-708.000.
Latasiewicz, Leonard, 4,551,586, Cl. 200-5.00A.
Moutrie, Michael F.; Sokola, Raymond L.; and Choi, Charles, 4,551,696, Cl. 333-204.000.
Pelley, Perry H., III, 4,551,641, Cl. 307-530.000.
Victor, Alan M.; and Davis, Darrell E., 4,551,856, Cl. 455-183.000.

Motsenbocker, Harold F. Target array. 4,550,918, Cl. 273-385.000.

Mott, Donna: *See*—
Halpern, Yuval; and Mott, Donna, 4,551,527, Cl. 544-214.000.

Mott, James D., to Hydril Company. Pressure operated safety valve with lock means. 4,550,780, Cl. 166-323.000.

Mott, Richard C., to Honeywell Inc. Pneumatic flow station. 4,550,616, Cl. 73-861.740.

Mottershead, Frank R., to Cross Company, The. Mechanism for preloading bearings. 4,551,032, Cl. 384-517.000.

Mount Isa Mines Limited: *See*—
Greenwood-Smith, Robin, 4,551,848, Cl. 378-045.000.

Moutrie, Michael F.; Sokola, Raymond L.; and Choi, Charles, to Motorola, Inc. Narrow bandwidth microstrip filter. 4,551,696, Cl. 333-204.000.

Mowry, Donald E., to Don Mowry Flexo Parts, Inc. Corrugated box machine glue apparatus. 4,551,124, Cl. 493-128.000.

Moy, Alexander, to Beltone Electronics Corporation. Electrical film resistor. 4,551,607, Cl. 219-121.0LJ.

Mroz, Andrzej; and Wronski, Stanislaw, to Politechnika Warszawska. Apparatus for dynamic classification of suspensions of solid bodies in liquids. 4,551,242, Cl. 209-211.000.

MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH: *See*—
Deutschmann, Herbert; and Wolters, Gerd-Michael, 4,550,568, Cl. 60-612.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Thoma, Martin, 4,551,434, Cl. 436-5.000.

Muchisky, Thomas P.; and Young, James V. Portable adjustable body tilt board. 4,550,901, Cl. 269-328.000.

Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Protease inhibitors. 4,551,279, Cl. 260-404.000.

Muench, Volker: *See*—
Blinne, Gerd; and Muench, Volker, 4,551,493, Cl. 524-89.000.

Muenzel, Wolf-Dietrich: *See*—
Andres, Rudolf; Grantz, Helmut; Muenzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,550,774, Cl. 165-104.210.

Muhlratzer, August: *See*—
Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, 4,551,328, Cl. 423-607.000.

Mukaiyama, Fumiaki: *See*—
Takeda, Koji; Akahane, Masao; Mukaiyama, Fumiaki; and Kudo, Yasuhiko, 4,551,846, Cl. 375-82.000.

Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Antithrombotic sulfoximino carbostyrils. 4,551,464, Cl. 514-312.000.

Muller, Franz: *See*—
Fischer, Kurt; and Muller, Franz, 4,550,765, Cl. 164-194.000.

Muller, Max: *See*—
Grabher, Erich; Muller, Max; Wetzel, Horst; and Schultschik, Robert, 4,550,955, Cl. 308-6.00C.

Multinorm B.V.: *See*—
Vissers, Hermanus H.; and Wondergem, Jan, 4,550,557, Cl. 56-341.000.

Muma, George A.: *See*—
Johnson, Richard H.; and Muma, George A., 4,550,467, Cl. 15-228.000.

Munks, R. Leonard. Animal sling. 4,550,686, Cl. 119-102.000.

Munro, Frederick G.: *See*—
Permut, Ronald; Cope, Robert; Apple, James; Epina, August P.; and Munro, Frederick G., 4,550,884, Cl. 242-139.000.

Murai, Toshiyuki: *See*—
Ootuka, Takayuki; and Murai, Toshiyuki, 4,550,703, Cl. 123-478.000.

Murakami, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor integrated circuit with isolation region made of dielectric material. 4,551,743, Cl. 357-50.000.

Murakami, Koichi; and Oguro, Takeshi, to Nissan Motor company, Limited. Semiconductor switching circuit with an overcurrent protection. 4,551,779, Cl. 361-86.000.

Murakami, Masahiro: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.

Murakami, Yoshiaki: *See*—
Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, 4,551,849, Cl. 381-86.000.

Murase, Koji, to Tokyo Shibaura Denki Kabushiki Kaisha. Air guide arrangement for a drum-type drier. 4,550,509, Cl. 34-133.000.

Murata Kikai Kabushiki Kaisha: *See*—
Fujiwara, Michiaki; and Ikeda, Toshiharu, 4,550,886, Cl. 242-35.60E.

Murayama, Akira: *See*—
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, 4,551,082, Cl. 418-55.000.

Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 4,551,481, Cl. 521-52.000.

Murphy, Kent A., to International Telephone and Telegraph Corporation. Low loss fused biconical taper optic coupler. 4,550,974, Cl. 350-96.150.

Murray, Robert J.: *See*—
Davidson, Thomas A.; and Murray, Robert J., 4,551,535, Cl. 546-121.000.

N.Y. Patent Development Corp.: *See*—
Grenthe, Bo, 4,551,253, Cl. 210-680.000.

Naab, Jakob, to Zoller-Kipper GmbH. Device for emptying containers into a collector. 4,551,057, Cl. 414-420.000.

Nabisco Brands, Inc.: *See*—
Gellman, Gary; Erburt, George A.; and Roe, James E., 4,551,343, Cl. 426-549.000.
Karwowski, Jan, 4,551,347, Cl. 426-621.000.

Nady, Louie A.: *See*—
Alesandrini, Carlo G., Jr.; and Nady, Louie A., 4,551,325, Cl. 423-488.000.

Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, to Hitachi, Ltd. Electrical fuel injector. 4,550,705, Cl. 123-488.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Front derailleur for a bicycle. 4,551,121, Cl. 474-140.000.

Nagao, Kenichi: *See*—
Saito, Tomotaka; and Nagao, Kenichi, 4,551,716, Cl. 340-711.000.

Nagatani, Toshio; Chiba, Norio; Hatanaka, Takao; and Saito, Toshio, to Konishiroku Photo Industry Co., Ltd. Packaged photographic product. 4,551,367, Cl. 428-35.000.

Nagy, Jozsef: *See*—
Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,551,132, Cl. 604-52.000.

Nahara, Akira: *See*—
Arai, Yoshihiro; and Nahara, Akira, 4,551,778, Cl. 360-131.000.

Nakadate, Toshihiko: *See*—
Numata, Morikuni; and Nakadate, Toshihiko, 4,551,605, Cl. 219-86.310.

Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Image forming process employing member with a depletion layer. 4,551,405, Cl. 430-64.000.

Nakahama, Ryoji: *See*—
Iwashita, Takashi; Atsumi, Shinya; and Nakahama, Ryoji, 4,551,104, Cl. 440-56.000.

Nakai, Masaaki: *See*—
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.

Nakamura, Akira: *See*—
Ikeda, Makoto; and Nakamura, Akira, 4,551,258, Cl. 252-32.70E.

Nakamura, Haruyoshi: *See*—
Tanaka, Akira; Tsunekawa, Takahiko; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,550,560, Cl. 57-261.000.

Nakamura, Kazuharu; Tsuboi, Yoshimasa; and Kondo, Akinobu, to Toyotomi Kogyo Co., Ltd. Construction for preventing oil leakage in oil burner. 4,550,709, Cl. 126-96.000.

Nakamura, Koki: *See—*
Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, 4,551,419, Cl. 430-445.000.
Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, 4,551,421, Cl. 430-509.000.

Nakamura, Shinji: *See—*
Fujii, Yasuhiko; Owaki, Isao; Saito, Susumu; Mori, Takaro; and Nakamura, Shinji, 4,551,840, Cl. 371-38.000.

Nakamura, Shuzo: *See—*
Sato, Hiroshi; and Nakamura, Shuzo, 4,551,568, Cl. 568-939.000.

Nakamura, Taku: *See—*
Ogawa, Masashi; Nakamura, Taku; Urata, Yukihide; and Yamauchi, Shingo, 4,551,412, Cl. 430-265.000.

Nakamura, Tsutomu: *See—*
Kita, Daizo; Nakamura, Tsutomu; and Kawachi, Takeshi, 4,551,256, Cl. 252-8.5LC.

Nakamura, Yasuo: *See—*
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,551,565, Cl. 568-864.000.

Nakanishi, Akira: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Morinaka, Hideo; Nonaka, Yunji; and Nakanishi, Akira, 4,551,169, Cl. 71-94.000.

Nakanishi, Hitoshi; and Ogura, Hiroyuki, to Yotsuami Limited. Fishing line knot. 4,550,938, Cl. 289-1.200.

Nakanishi, Kiyoshi: *See—*
Okumura, Takeshi; Warashina, Tomio; and Nakanishi, Kiyoshi, 4,550,699, Cl. 123-308.000.

Nakanishi, Tsugio: *See—*
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.

Nakano, Kenji: *See—*
Machida, Yukihiko; Nakano, Kenji; and Takahashi, Takao, 4,551,771, Cl. 360-19.100.

Nakao, Etsuro: *See—*
Tamura, Tadashi; Nakao, Etsuro; and Yamazaki, Hiroaki, 4,551,402, Cl. 429-254.000.

Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, to Nippon Kokan Kabushiki Kaisha. Method for adjusting composition of molten steel in arc process. 4,551,173, Cl. 75-12.000.

Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, to Nippon Kokan Kabushiki Kaisha. Method of refining molten steel by arc process. 4,551,174, Cl. 75-12.000.

Nakatomi, Yoshisugu; Uchida, Kohachi; and Hashimoto, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Original carrier for use with an image forming device. 4,551,014, Cl. 355-75.000.

Nakauchi, Kenji, to Fuji Photo Film Co., Ltd. System for recording information on photographic image density and process. 4,551,023, Cl. 356-444.000.

Nakazato, Katsuo: *See—*
Tsuchiya, Hiroyoshi; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Otsuka, Hirotaka, 4,551,768, Cl. 358-283.000.

Nakazawa, Takahiro: *See—*
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.

Nakel, Gunther M.; and Heckert, David C., to Procter & Gamble Company, The. Beverages containing specific cation-edible acid mixtures for improved flavor impression. 4,551,342, Cl. 426-548.000.

Naragon, Richard S.: *See—*
Douglass, Randle; Jacquin, H. George; Chewey, Paul M.; Galvan, Paul A.; and Naragon, Richard S., 4,550,888, Cl. 244-3.220.

Narita, Seiichi: *See—*
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,550,618, Cl. 73-862.340.

Narita, Takato, to Sony Corporation. Circuit to vary the phase of the color burst signal. 4,551,749, Cl. 358-28.000.

Narr, Berthold: *See—*
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,551,464, Cl. 514-312.000.

Naruse, Kazuhiko: *See—*
Yuasa, Yoshio; Yasumoto, Hidetoshi; Kawagoe, Nobukazu; Naruse, Kazuhiko; and Inaba, Masahito, 4,551,011, Cl. 355-35.000.

Nash Engineering Company, The: *See—*
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,551,070, Cl. 417-68.000.

Nashimoto, Toshiyuki: *See—*
Beppu, Masaru; Agawa, Setsuo; Hazeyama, Takeshi; and Nashimoto, Toshiyuki, 4,551,240, Cl. 209-143.000.

Nathan, Walter; and Zucker, Armand S., to RTC Industries, Inc. Modular display rack. 4,550,838, Cl. 211-128.000.

National Research Development Corporation: *See—*
Hall, Timothy J.; and Tridgell, Eric J., 4,550,527, Cl. 47-58.000.
Johnson, Nicholas D., 4,550,609, Cl. 73-642.000.
Warner, Anne, 4,551,165, Cl. 71-24.000.

National Starch and Chemical Corporation: *See—*
Trubiano, Paolo C.; and Kasica, James J., 4,551,177, Cl. 106-210.000.

National Steel Corporation: *See—*
Bell, John R.; Scoville, Robert E.; and Whitt, Joade, 4,550,867, Cl. 222-607.000.

Naumann, Ted F., Jr.: *See—*
Carnes, Ronald C.; and Naumann, Ted F., Jr., 4,550,608, Cl. 73-633.000.

Nausedas, Joseph A., to Union Carbide Corporation. Shirred casing stick article with end closure and method for making the same. 4,551,370, Cl. 428-36.000.

NCR Corporation: *See—*
Heys, George; and Coon, Dennis R., 4,551,675, Cl. 324-158.00F.

NDM Corporation: *See—*
Aicher, Frederick T.; Martin, James R., Sr.; and Flanagan, William T., 4,550,961, Cl. 339-14.00R.

NEC Corporation: *See—*
Oka, Hideo, 4,551,786, Cl. 361-306.000.
Suzuki, Masayoshi; and Saigo, Kazuhide, 4,551,417, Cl. 430-316.000.

Nehring, Rudolf: *See—*
Otte, Werner; Nehring, Rudolf; and zur Hausen, Manfred, 4,551,564, Cl. 568-834.000.

Neiman S.A.: *See—*
Neyret, Guy, 4,550,580, Cl. 70-370.000.

Nelson, Marguerite D. Mop. 4,550,468, Cl. 15-229.00A.

Nelson, Randall B., to International Telephone and Telegraph Corporation. Reduction of organic waste odors. 4,551,305, Cl. 422-5.000.

Neri, Michael A. Method of producing freeze dried fish eggs. 4,551,333, Cl. 426-1.000.

Nesky, Robert W.: *See—*
Darrow, Russell E.; Ingraham, Glenn J.; Larnerd, John D.; and Nesky, Robert W., 4,550,493, Cl. 29-739.000.

Neumann, Jacques, to Ateliers de Constructions Electriques de Charleroi (ACEC)-Societe Anonyme. Simulator for training airplane pilots. 4,551,101, Cl. 434-55.000.

Neumann, Stephen M.: *See—*
Brust, David P.; Neumann, Stephen M.; and Weissberger, Edward, 4,551,411, Cl. 430-216.000.

Neyret, Guy, to Neiman S.A. Rotatable connection device. 4,550,580, Cl. 70-370.000.

NGK Insulators, Ltd.: *See—*
Takeuchi, Yukihisa, 4,551,357, Cl. 427-96.000.

Nicholson, Chris G.: *See—*
Bykerk, Rocky S., 4,551,781, Cl. 361-143.000.

Nickl, Josef: *See—*
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,551,464, Cl. 514-312.000.

Nicolai, Daniel W.: *See—*
Stiefel, Werner K.; and Nicolai, Daniel W., 4,551,480, Cl. 514-680.000.

Niederer, Kurt W., to Belmont Textile Machinery Company. Method and apparatus for detecting the position of a take-up package during an automatic doffing and donning cycle. 4,550,880, Cl. 242-18.0DD.

Nifco Inc.: *See—*
Omata, Nobuaki, 4,550,470, Cl. 16-85.000.

Nikolov, Ivan D., to Institute po Metaloznanie I Technologia na Metalite. Method and machine for pressure diecasting. 4,550,763, Cl. 164-119.000.

Ninomiya, Masakazu: *See—*
Suzuki, Atsushi; Ninomiya, Masakazu; Maeda, Katsuya; and Kawashima, Yutaka, 4,550,701, Cl. 123-436.000.

Nippon Electric Co., Ltd.: *See—*
Higashiguchi, Toshiaki; and Sonoda, Michiaki, 4,551,767, Cl. 358-257.000.
Hirai, Yoshihiko, 4,550,982, Cl. 350-357.000.

Nippon Hoso Kyokai: *See—*
Nishizawa, Taiji; and Tanaka, Yutaka, 4,551,753, Cl. 358-140.000.

Nippon Kogaku K.K.: *See—*
Ishizaka, Sunao; and Maida, Osamu, 4,550,991, Cl. 354-21.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Kanayama, Kiyoshi; and Asano, Shoji, 4,550,635, Cl. 82-4.00C.
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,173, Cl. 75-12.000.
Nakashima, Hirohisa; Komatsu, Yoshimi; Ikeda, Masafumi; and Kondo, Tsuneo, 4,551,174, Cl. 75-12.000.

Nippon Kokan Koji Kabushiki Kaisha: *See—*
Kanayama, Kiyoshi; and Asano, Shoji, 4,550,635, Cl. 82-4.00C.

Nippon Oil Seal Industry Co., Ltd.: *See—*
Matsushima, Noboru, 4,550,920, Cl. 277-134.000.
Yarimizu, Kenichi, 4,550,486, Cl. 29-451.000.

Nippon Soken, Inc.: *See—*
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,550,744, Cl. 137-80.000.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,550,618, Cl. 73-862.340.

Nippon Steel Corporation: *See—*
Akisue, Osamu; Yamada, Teruaki; Ueda, Shigeru; Tokunaga, Yoshikuni; and Yamada, Masato, 4,551,182, Cl. 148-12.00C.

Nippondenso Co., Ltd.: *See—*
Itoh, Hiroyasu; Suzuki, Yasutoshi; Horiuchi, Yasuhiro; and Hara, Kunihiko, 4,551,669, Cl. 323-268.000.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,550,618, Cl. 73-862.340.
Suzuki, Atsushi; Ninomiya, Masakazu; Maeda, Katsuya; and Kawashima, Yutaka, 4,550,701, Cl. 123-436.000.

Tsuda, Tadashi; Hiramatsu, Seiichiro; Ohtsuka, Mitsugi; and Maeno, Tsuyoshi, 4,551,722, Cl. 340-904.000.
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, to Omron Tateisi Electronics, Co. Push-button switch. 4,551,592, Cl. 200-67.00D.
Nishi, Kohichi; and Takahashi, Akira, to Ricoh Company, Ltd. Automatic exposure control circuit. 4,550,997, Cl. 354-459.000.
Nishikata, Goro, to Mitutoyo Mfg. Co., Ltd. Thread construction in length measuring instrument and method for manufacturing thread construction. 4,550,507, Cl. 33-164.00R.
Nishikawa, Eiichiro; Shinya, Masuo; Ueda, Kayako; and Kaneko, Katsumi, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing carbonyl compounds. 4,551,556, Cl. 568-403.000.
Nishikawa, Masaji, to Olympus Optical Company Limited. Toner concentration detecting device. 4,550,998, Cl. 355-3.0DD.
Nishimori, Eiji; Tsuchiya, Chikara; and Sano, Yoshiaki, to Fujitsu Limited. Field effect transistor gate circuit for analog signals. 4,551,644, Cl. 307-573.000.
Nishimura, Nobuichi, to Kabushiki Kaisha Toshiba. Heat cooking apparatus with temperature operating system. 4,551,601, Cl. 219-10.55B.
Nishimura, Satoshi: *See*—
Hayakawa, Masanori; Yamada, Noriaki; Kawamoto, Hiromi; and Nishimura, Satoshi, 4,551,260, Cl. 252-62.590.
Nishino, Fumio: *See*—
Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, 4,551,000, Cl. 355-3.00R.
Nishiwaki, Akira: *See*—
Moriguchi, Hiroyuki; Matsumoto, Masanori; Nishiwaki, Akira; Morohoshi, Yasuo; and Nomori, Hiroyuki, 4,551,303, Cl. 420-590.000.
Nishizawa, Taiji; and Tanaka, Yutaka, to Nippon Hoso Kyokai. Picture signal processing system including spatio-temporal filter. 4,551,753, Cl. 358-140.000.
Nissan Motor Co., Ltd.: *See*—
Fujita, Masahiro; and Uemura, Yukio, 4,550,633, Cl. 81-56.000.
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, 4,551,803, Cl. 364-431.050.
Iida, Hideo, 4,550,754, Cl. 139-452.000.
Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, 4,551,849, Cl. 381-86.000.
Kikuchi, Yasuyuki; Matsumoto, Eiichi; and Tanaka, Yoshimasa, 4,550,695, Cl. 123-41.120.
Murakami, Koichi; and Oguro, Takeshi, 4,551,779, Cl. 361-86.000.
Nisshin Steel Company, Ltd.: *See*—
Hoshino, Kazuo; Tanaka, Teruo; and Ito, Kenjiro, 4,550,487, Cl. 29-527.700.
Nissinen, Martti: *See*—
Lehtikoski, Olavi; and Nissinen, Martti, 4,550,613, Cl. 73-834.000.
Nisus Video Incorporated: *See* –
Swinehart, Steven L.; and Kuhn, Werner H., 4,551,763, Cl. 358-225.000.
Nitanda, Hiroshi: *See*—
Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, 4,551,000, Cl. 355-3.00R.
Nitowski, Ronald: *See*—
Donais, Norman; and Nitowski, Ronald, 4,550,964, Cl. 339-44.00M.
Nitsch, Klaus D.: *See*—
Borchert, Werner; and Nitsch, Klaus D., 4,551,247, Cl. 210-304.000.
Nitsuko Limited: *See*—
Matsuo, Nobuo, 4,551,582, Cl. 179-81.00R.
Nittetsu Mining Co., Ltd.: *See*—
Beppu, Masaru; Agawa, Setsuo; Hazeyama, Takeshi; and Nashimoto, Toshiyuki, 4,551,240, Cl. 209-143.000.
Nitto Boseki Co., Ltd.: *See*—
Sato, Masanori; and Iizima, Kazuo, 4,551,375, Cl. 428-57.000.
Nitz, Rolf-Eberhard: *See*—
Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,551,454, Cl. 514-252.000.
Niwa, Masatake: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.
NKG Insulators, Ltd.: *See*—
Nozaki, Hiroshi, 4,551,578, Cl. 174-182.000.
Noda, Tamotsu; Tamura, Hifumi; and Okano, Hiroshi, to Hitachi, Ltd. Field-emission ion source with spiral shaped filament heater. 4,551,650, Cl. 313-362.100.
Noel, Gapp: *See*—
Vilain, Claude; and Noel, Gapp, 4,550,932, Cl. 280-689.000.
Noguchi, Yasuhiro: *See*—
Koyama, Koichi; Noguchi, Yasuhiro; and Toriuchi, Masaharu, 4,551,423, Cl. 430-559.000.
Noji, Masahide: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,551,524, Cl. 536-121.000.
Nolan, Robert L., to Maxcap, Inc. Bottle caps. 4,550,843, Cl. 215-252.000.
Nomori, Hiroyuki: *See*—
Moriguchi, Hiroyuki; Matsumoto, Masanori; Nishiwaki, Akira; Morohoshi, Yasuo; and Nomori, Hiroyuki, 4,551,303, Cl. 420-590.000.
Nomoto, Isami: *See*—
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.
Nomura, Akihiro: *See*—
Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, 4,551,000, Cl. 355-3.00R.
Nomura, Hiroaki: *See*—
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, 4,551,532, Cl. 546-22.000.
Nomura, Hirokazu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.
Nonaka, Yunji: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Morinaka, Hideo; Nonaka, Yunji; and Nakanishi, Akira, 4,551,169, Cl. 71-94.000.
Noomen, Pieter J., to Dowe Egberts Koninklijke Tabaksfabrier Koffiebranderijen Theehandel N.V. Timed-dispensing method and apparatus. 4,550,858, Cl. 222-1.000.
Nordson Corporation: *See*—
Langer, Alfred, 4,550,642, Cl. 91-346.000.
Norman, Howard M., to Norman, Marion E., a part interest. Compact, portable drain to empty and clean a recreational vehicle holding tank. 4,550,453, Cl. 4-323.000.
Norman, Marion E.: *See*—
Norman, Howard M., 4,550,453, Cl. 4-323.000.
Noro, Yoshihiko: *See*—
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.
Northern Telecom Limited: *See*—
Bouffard, Jean; Dumoulin, Andre ; and Lederhose, Edgar K., 4,550,558, Cl. 57-58.520.
Pan, Ali; and Cohrs, Karl S., 4,551,087, Cl. 425-466.000.
Vella, Paul J.; Garel-Jones, Philip M.; and Lowe, Richard S., 4,551,019, Cl. 356-73.100.
Norton Christensen, Inc.: *See*—
Link, Howard D., 4,550,790, Cl. 175-329.000.
Novatome: *See*—
Zuber, Thierry; and Traiteur, Rene , 4,550,688, Cl. 122-360.000.
Novotry, Jaroslay: *See*—
Skvara, Frantisek; Kolar, Karel; Zadak, Zdenek; Friml, Zdenek; and Novotry, Jaroslay, 4,551,176, Cl. 106-90.000.
Nowack, Gerhard P.: *See*—
Kukes, Simon G.; and Nowack, Gerhard P., 4,551,230, Cl. 208-89.000.
Nozaki, Hiroshi, to NKG Insulators, Ltd. Ball and socket type suspension insulator. 4,551,578, Cl. 174-182.000.
Numata, Morikuni; and Nakadate, Toshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Gun arm apparatus for resistance welding gun. 4,551,605, Cl. 219-86.310.
Nunez, Chris E., to Warner-Lambert Company. Fluid flow regulating unit for intravascular catheter systems. 4,550,748, Cl. 137-605.000.
Nunokawa, Hideo: *See*—
Takahashi, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, 4,551,634, Cl. 307-243.000.
Nuova Faema S.p.A.: *See*—
Longo, Walter G., 4,551,611, Cl. 219-308.000.
Nussdorfer, William R.; Brancheau, Harry A.; and Clark, Steven C., to White Consolidated Industries, Inc. Reverse cycle room air conditioner with auxilliary heat actuated at low and high outdoor temperatures. 4,550,770, Cl. 165-29.000.
Nuvatec, Inc.: *See*—
Slavik, William H.; and Huber, William B., 4,551,134, Cl. 604-67.000.
N.V. Nederlandsche Apparatenfabriek Nedap: *See*—
Fockens, Tallienco W. H., 4,551,712, Cl. 340-572.000.
Obayashi, Hideki: *See*—
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,550,618, Cl. 73-862.340.
Ochirov, Nikolai I.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.
Oda, Yoshio; and Morimoto, Takeshi, to Asahi Glass Company, Ltd. Gas diffusion electrode material. 4,551,220, Cl. 204-294.000.
Oddi, Michael J.: *See*—
Gulla, Michael; Taylor, Paul; and Oddi, Michael J., 4,551,409, Cl. 430-192.000.
Odebrecht, Wolfgang: *See*—
Andres, Rudolf; Grantz, Helmut; Muenzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,550,774, Cl. 165-104.210.
Oetting, William A.: *See*—
Dow, John, Jr.; Oetting, William A.; and Yessian, Richard J., 4,550,859, Cl. 222-26.000.
Ogawa, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Hysteresis circuit with small hysteresis amplitude and oscillator using the hysteresis circuit. 4,551,691, Cl. 331-111.000.
Ogawa, Hisashi; Tanaka, Yasushi; and Sato, Yoshimitsu, to Toyota Jidosha Kabushiki Kaisha. Fuel supplying means installed on a lateral cross member of a vehicle. 4,550,923, Cl. 280-5.00A.

Ogawa, Kimiaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Video camera. 4,551,764, Cl. 358-228.000.
Ogawa, Masashi; Nakamura, Taku; Urata, Yukihide; and Yamauchi, Shingo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material for photomechanical process and method of reduction treatment therefore. 4,551,412, Cl. 430-265.000.
Ogawa, Masataka: *See*—
Takahashi, Yoshiteru; and Ogawa, Masataka, 4,551,645, Cl. 310-46.000.
Ogawa, Masumi; Kawakami, Hiromi; and Meguro, Toshiaki, to Sony Corporation. Intercarrier sound detecting apparatus for a television receiver. 4,551,756, Cl. 358-197.000.
Ogawa, Tsutomu: *See*—
Yamazaki, Yoshinori; and Ogawa, Tsutomu, 4,550,631, Cl. 74-822.000.
Ogino, Satoru, to Kobishi Electric Co., Ltd. Electric terminal. 4,550,970, Cl. 339-97.00P.
OGRAD s.r.l.: *See*—
Grati, Giorgio, 4,550,853, Cl. 220-416.000.
Ogura, Hiroyuki: *See*—
Nakanishi, Hitoshi; and Ogura, Hiroyuki, 4,550,938, Cl. 289-1.200.
Oguro, Takeshi: *See*—
Murakami, Koichi; and Oguro, Takeshi, 4,551,779, Cl. 361-86.000.
Ohba, Shiya: *See*—
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.
Ohbayashi-Gumi, Ltd.: *See*—
Kita, Daizo; Nakamura, Tsutomu; and Kawachi, Takeshi, 4,551,256, Cl. 252-8.5LC.
Ohgaki, Kichio; and Ohshima, Kazuhiro, to Kyosan Denki Kabushiki Kaisha. Diaphragm-type fuel pump. 4,551,071, Cl. 417-313.000.
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, to Matsushita Electric Industrial Co., Ltd. Method for driving solid-state image sensor. 4,551,757, Cl. 358-212.000.
Ohlgren, Eilef J. Building construction lift apparatus. 4,550,807, Cl. 187-10.000.
Ohnishi, Yutaka, to Tachikawa Spring Co., Ltd. Fillet-welding equipment for pipe materials. 4,550,872, Cl. 228-48.000.
Ohshima, Kazuhiro: *See*—
Ohgaki, Kichio; and Ohshima, Kazuhiro, 4,551,071, Cl. 417-313.000.
Ohtake, Etsuo; and Yamazaki, Kazuhiro, to Daicel Chemical Industries, Ltd. Porous spherical cellulose acetate particles. 4,551,389, Cl. 428-402.000.
Ohtsuka, Masanori; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Motor drive control circuit. 4,550,992, Cl. 354-173.110.
Ohtsuka, Mitsugi: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichiro; Ohtsuka, Mitsugi; and Maeno, Tsuyoshi, 4,551,722, Cl. 340-904.000.
Ohya, Shizuko: *See*—
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.
Oiles Industry Co., Ltd.: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Hirai, Kazuo; Miyasaka, Kingo; and Izumi, Masayoshi, 4,551,393, Cl. 428-609.000.
Oka, Hideo, to NEC Corporation. Unencapsulated solid electrolytic capacitor and method for manufacturing the same. 4,551,786, Cl. 361-306.000.
Okada, Toshiteru: *See*—
Imada, Nobuyuki; and Okada, Toshiteru, 4,551,254, Cl. 210-688.000.
Okamoto, Kiyohide: *See*—
Fukuyama, Toshifumi; and Okamoto, Kiyohide, 4,551,640, Cl. 307-471.000.
Okamura, Takayuki: *See*—
Matsumoto, Mitsuo; Hirai, Koji; Yoshimura, Noriaki; and Okamura, Takayuki, 4,551,518, Cl. 528-80.000.
Okaniwa, Kenichiro: *See*—
Koyama, Mikio; Kikugawa, Shozo; and Okaniwa, Kenichiro, 4,551,307, Cl. 422-56.000.
Okano, Hiroshi: *See*—
Noda, Tamotsu; Tamura, Hifumi; and Okano, Hiroshi, 4,551,650, Cl. 313-362.100.
Okawa, Susumu: *See*—
Sugaya, Masami; Sawada, Daisaku; and Okawa, Susumu, 4,551,119, Cl. 474-28.000.
Oki Electric Industry Co., Ltd.: *See*—
Yokouchi, Hiroshi; and Iketani, Ryuichi, 4,551,821, Cl. 365-203.000.
Okubo, Takeshi; Kodachi, Hideo; and Miyanaka, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Gang head type machine tool. 4,550,488, Cl. 29-568.000.
Okumura, Takeshi; Warashina, Tomio; and Nakanishi, Kiyoshi, to Toyota Jidosha Kabushiki Kaisha. Intake device of an internal combustion engine. 4,550,699, Cl. 123-308.000.
Okutu, Toshimitu: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, 4,551,386, Cl. 428-323.000.
Olcott, Robert S., Jr., to Armstrong World Industries, Inc. Two-ply spinning cots. 4,550,478, Cl. 29-130.000.
Olenick, Ralph W. Flexible, extensible robot arm. 4,551,061, Cl. 414-735.000.
Olin Corporation: *See*—
Cash, Gordon G., 4,551,200, Cl. 162-135.000.
Cash, Gordon G., 4,551,201, Cl. 162-158.000.
Parthasarathi, Arvind, 4,551,210, Cl. 204-28.000.
Oliver, Ronald A. Replacement spool for rotating line vegetation cutter. 4,550,498, Cl. 30-276.000.
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., to Nash Engineering Company, The. Noise control for conically ported liquid ring pumps. 4,551,070, Cl. 417-68.000.
Olson, Jay. Method and apparatus for obtaining a concentrated extract from liquid smoke. 4,551,339, Cl. 426-384.000.
Olson, Roy E., to Rockwell International Corporation. Rounded-end protuberances for field-emission cathodes. 4,551,649, Cl. 313-336.000.
Olsson, Frank C.: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,550,956, Cl. 312-250.000.
Olympus Optical Company: *See*—
Kinoshita, Kunio, 4,550,716, Cl. 128-6.000.
Olympus Optical Co., Ltd.: *See*—
Miyashita, Kiyoshi; Ozeki, Fumitaka; and Tsuda, Hiroshi, 4,551,010, Cl. 355-25.000.
Nishikawa, Masaji, 4,550,998, Cl. 355-3.0DD.
Omae, Masanori: *See*—
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, 4,551,757, Cl. 358-212.000.
O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., to Rich Products Corporation. Sugar infusion of fruit. 4,551,348, Cl. 426-639.000.
Omaki, Takanobu: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.
Omata, Nobuaki, to Nifco Inc. Combined rotary damper device including a stored energy mechanism and braking mechanism. 4,550,470, Cl. 16-85.000.
Omniglass Ltd.: *See*—
Davies, Lawrence W., 4,551,364, Cl. 428-34.000.
Omori, Takeshi: *See*—
Takahashi, Kiyoshi; Konagai, Makoto; Yoshitomi, Toshihiko; and Omori, Takeshi, 4,551,575, Cl. 136-255.000.
Omron Tateisi Electronics Co.: *See*—
Fukuyama, Toshifumi; and Okamoto, Kiyohide, 4,551,640, Cl. 307-471.000.
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, 4,551,592, Cl. 200-67.00D.
Omura, Takashi: *See*—
Otake, Katsumasa; Ikeda, Takashi; Omura, Takashi; and Imada, Kunihiko, 4,551,150, Cl. 8-496.000.
Onahama Sakai Kagaku Kabushiki Kaisha: *See*—
Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, 4,551,497, Cl. 524-423.000.
Onoda, Shigeyoshi: *See*—
Kanemitsu, Shinji; Onoda, Shigeyoshi; Nishino, Fumio; Nomura, Akihiro; Mizutani, Morikazu; and Nitanda, Hiroshi, 4,551,000, Cl. 355-3.00R.
Onoue, Makoto: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, 4,551,602, Cl. 219-69.00D.
Onuki, Katsuhiro: *See*—
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.
Oosaka, Kuniaki: *See*—
Hamada, Makoto; Hasegawa, Junji; and Oosaka, Kuniaki, 4,550,948, Cl. 296-202.000.
Ootuka, Takayuki; and Murai, Toshiyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Continous method of fuel injection in electronically controlled engine. 4,550,703, Cl. 123-478.000.
Opower, Hans, to W.C. Heraeus GmbH. Material working apparatus. 4,551,608, Cl. 219-121.00L.
Orcutt, Donald E.: *See*—
Coleman, D. Jackson; Orcutt, Donald E.; and Berkowitz, Herbert, 4,551,129, Cl. 604-21.000.
Ortiz, Ralph O. Cube game of skill and chance. 4,550,916, Cl. 273-239.000.
Osborne, Thomas A., to Cook Incorporated. Flexible sheath assembly for an indwelling catheter. 4,551,137, Cl. 604-171.000.
Oshiage, Katsunori: *See*—
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, 4,551,803, Cl. 364-431.050.
Osypka, Peter. Intravenously implantable electrode lead for use with cardiac pacemakers. 4,550,737, Cl. 128-785.000.
Otake, Katsumasa; Ikeda, Takashi; Omura, Takashi; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Method for dyeing cellulose fiber material using fiber-reactive disazo dye and finishing the same. 4,551,150, Cl. 8-496.000.
Otis Elevator Company: *See*—
DeViaris, Guy, 4,550,663, Cl. 104-119.000.
Otsuka, Hirotaka: *See*—
Tsuchiya, Hiroyoshi; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Otsuka, Hirotaka, 4,551,768, Cl. 358-283.000.
Otsuka, Tsuneo: *See*—
Inoue, Kazuo; and Otsuka, Tsuneo, 4,550,794, Cl. 180-219.000.

Otte, Werner; Nehring, Rudolf; and zur Hausen, Manfred, to Chemische Werke Huels, AG. Process for the production of 2- and 4-tert-butylcyclohexanols with high proportions of cis-isomers by catalytic-hydrogenation of the corresponding tert-butylphenols. 4,551,564, Cl. 568-834.000.

Ottestad, Jack B.; and Duehr, Bernard W., Jr. Tool mounting means for a hydraulically powered impact hammer. 4,550,784, Cl. 173-114.000.

Otu, Koichi: *See*—
Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, 4,551,497, Cl. 524-423.000.

Ouhayoun, Michel; and Robert, Alain, to Societe Anonyme de Telecommunications. Gas wave-guide laser generator. 4,551,843, Cl. 372-87.000.

Outboard Marine Corporation: *See*—
DuBois, Chester G., 4,551,076, Cl. 417-395.000.
Ehrlich, Josef, 4,550,696, Cl. 123-73.00D.
Hall, Charles B., 4,551,105, Cl. 440-61.000.
Hansen, Loren F., 4,550,783, Cl. 172-21.000.
McAuliffe, Gerald N., 4,551,667, Cl. 320-46.000.
West, James C.; and Gesell, Elmer G., 4,550,762, Cl. 164-98.000.

Ovanin, George J.: *See*—
Hall, William E.; Gailey, Edward D.; and Ovanin, George J., 4,550,922, Cl. 279-119.000.

Owaki, Isao: *See*—
Fujii, Yasuhiko; Owaki, Isao; Saito, Susumu; Mori, Takaro; and Nakamura, Shinji, 4,551,840, Cl. 371-38.000.

Owens-Corning Fiberglas Corporation: *See*—
Canning, John L.; and Kay, John F., 4,551,390, Cl. 428-431.000.
Frailey, Richard C.; and Symborski, Alex P., 4,551,160, Cl. 65-2.000.
Grossi, Anthony V.; Hahn, Louis T.; and Marzocchi, Alfred, 4,551,178, Cl. 106-273.00N.

Owens-Illinois, Inc.: *See*—
Burzynski, Alfred J.; and Tillman, James J., 4,551,361, Cl. 427-164.000.
Lininger, Michael A., 4,550,844, Cl. 215-252.000.
Rhoads, Roger R., 4,550,824, Cl. 206-150.000.

Owensby, Joseph E.; Rupp, Jody W.; Dobbins, Frederick A.; and Waldrop, Thomas E., to W. R. Grace & Co., Cryovac Div. Method and apparatus for vacuum packaging with preshrinking. 4,550,548, Cl. 53-434.000.

Oxenrider, Bryce C., to Allied Corporation. Process for the production of fluorinated pyromellitate containing mixtures useful as surfactants. 4,551,519, Cl. 528-296.000.

Ozaki, Hideyuki: *See*—
Shimotori, Kazuhiro; and Ozaki, Hideyuki, 4,551,741, Cl. 357-23.600.

Ozaki, Toshifumi: *See*—
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.

Ozeki, Fumitaka: *See*—
Miyashita, Kiyoshi; Ozeki, Fumitaka; and Tsuda, Hiroshi, 4,551,010, Cl. 355-25.000.

Ozono, Jiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas turbine control systems. 4,550,565, Cl. 60-39.182.

P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG: *See*—
Korth, Jurgen, 4,550,750, Cl. 137-868.000.

P. F. Cosmetique: *See*—
Kaeser, Charles, 4,550,718, Cl. 128-57.000.

Pacht, Amos, to Butterworth Inc. High pressure pump. 4,551,077, Cl. 417-454.000.

Pacific Scientific Company: *See*—
Wright, William S., Jr., 4,550,589, Cl. 73-11.000.

Padalka, Valentin G.: *See*—
Axenov, Ivan I.; Bren, Viktor G.; Padalka, Valentin G.; Sablev, Leonid P.; Stupak, Rimma I.; and Khoroshikh, Vladimir M., 4,551,221, Cl. 204-298.000.

Padeiskaya, Elena N.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.

Paguba, Alexandr I.: *See*—
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.

Pain Suppression Labs, Inc.: *See*—
Liss, Saul; and Liss, Bernard S., 4,550,733, Cl. 128-421.000.

Pallosy nee Becker, Katalin: *See*—
Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,551,132, Cl. 604-52.000.

Palmer, James L.: *See*—
Kovach, Stephen M.; and Palmer, James L., 4,551,231, Cl. 208-120.000.

Palmer, Richard C.; and Plotnick, Michael A., to RCA Corporation. Video disc encoding and decoding system providing intra-field track error correction. 4,551,770, Cl. 358-342.000.

Palosi, Eva: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.

Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.

Paluzzi, Joseph A.: *See*—
Davidescu, Reghina; de Ceglie, Gaetano J.; Jacquett, Harold W.; and Paluzzi, Joseph A., 4,551,345, Cl. 426-594.000.

Pan, Ali; and Cohrs, Karl S., to Northern Telecom Limited. Extrusion apparatus. 4,551,087, Cl. 425-466.000.

Pander, Peter: *See*—
Schwab, Erwin; Parisi, Graziano; and Pander, Peter, 4,551,289, Cl. 264-23.000.

Pankove, Jacques I., to RCA Corporation. Method of making P-type hydrogenated amorphous silicon. 4,551,352, Cl. 427-39.000.

Pantone, Richard S.: *See*—
Yeater, Robert P.; Pantone, Richard S.; and Rieck, James N., 4,551,498, Cl. 524-424.000.

Panush, Sol, to Inmont Corporation. Pearlescent automotive paint compositions. 4,551,491, Cl. 524-31.000.

Panzera, Carlino, to Johnson & Johnson Dental Products Company. Ceramic dental restorative. 4,551,099, Cl. 433-212.100.

Paraskevopoulos, Demetris E., to Xerox Corporation. Toner concentration sensor. 4,551,004, Cl. 355-3.0DD.

Parikh, Kamal I., to GTE Automatic Electric Incorporated. Cross-copy arrangement for synchronizing error detection clock signals in a duplex digital system. 4,551,836, Cl. 371-1.000.

Parisi, Graziano: *See*—
Schwab, Erwin; Parisi, Graziano; and Pander, Peter, 4,551,289, Cl. 264-23.000.

Park, Duk-Won, to University of Alabama, The Board of Trustees of the. Roof bolt hole groover. 4,550,788, Cl. 175-173.000.

Parker, Keith E.: *See*—
Plaas, Jon R.; Parker, Keith E.; Keiser, James D.; and Johnson, Elmer C., Jr., 4,551,139, Cl. 604-290.000.

Parlex Corporation: *See*—
Rich, Donald S., 4,551,576, Cl. 174-36.000.

Parr, Ehrfried: *See*—
Strack, Hans; Roebke, Wolfgang; Kneitel, Dieter; and Parr, Ehrfried, 4,551,322, Cl. 423-329.000.

Parrish, J. Gid: *See*—
Bykerk, Rocky S., 4,551,781, Cl. 361-143.000.

Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., to Imperial Chemical Industries PLC. Antifungal triazole ethanol derivatives. 4,551,469, Cl. 514-383.000.

Parthasarathi, Arvind, to Olin Corporation. Dendritic treatment of metallic surfaces for improving adhesive bonding. 4,551,210, Cl. 204-28.000.

Partis, Richard A.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,551,279, Cl. 260-404.000.

Pask, George, to Rolls-Royce Limited. Turbine shroud and turbine shroud assembly. 4,551,064, Cl. 415-116.000.

Passarotti, Carlo: *See*—
Doria, Gianfederico; Passarotti, Carlo; Arcari, Giuliana; and Buttinoni, Ada, 4,551,457, Cl. 514-258.000.
Faustini, Franco; Passarotti, Carlo; Ceserani, Roberto; and Gandolfi, Carmelo, 4,551,476, Cl. 514-461.000.

Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin. Pharmaceutically acceptable silicon rubber and therapeutical set and the use thereof for surgical embolization. 4,551,132, Cl. 604-52.000.

Patel, Rohit A.: *See*—
Herbert, William B.; and Patel, Rohit A., 4,551,130, Cl. 604-32.000.

Pater, Arnold R.: *See*—
Fehrenkamp, William; Pater, Arnold R.; and Brummel, Arthur D., 4,551,824, Cl. 367-76.000.

Paterson, Alan J. F., to Air Products and Chemicals, Inc. Method for reducing the volume of atmosphere needed to inhibit ingress of ambient oxygen into the furnace chamber of a continuous heat treatment furnace. 4,551,091, Cl. 432-23.000.

Paterson, Noel S., to Sundstrand Data Control, Inc. Excessive descent rate warning system for rotary wing aircraft. 4,551,723, Cl. 340-946.000.

Patil, Ghanshyam: *See*—
Mai, Khuong H. X.; and Patil, Ghanshyam, 4,551,526, Cl. 544-163.000.
Mai, Khuong H. X.; and Patil, Ghanshyam, 4,551,537, Cl. 546-330.000.

Paton, Anthony D.: *See*—
Lewis, John D.; Keeling, Michael R.; Bowen, David R.; and Paton, Anthony D., 4,551,731, Cl. 346-75.000.

Patron, Henri: *See*—
Fournier, Jean; Patron, Henri; and Meynard, Paul, 4,550,777, Cl. 165-162.000.

Pattarozzi, Domenico, to B.S.P. Packaging Systems di Pattarozzi D. & C.s.a.s. Device for forming, from the top downwards, articles into a stack of orderly layers. 4,551,052, Cl. 414-81.000.

Pattern Processing Technologies, Inc.: *See*—
Werth, Larry J.; and Paulson, Larry G., 4,551,850, Cl. 382-18.000.

Patterson, Michael, to ASE (UK) Limited. Adjustable anchorage. 4,550,933, Cl. 280-808.000.

Paulson, Larry G.: *See*—
Werth, Larry J.; and Paulson, Larry G., 4,551,850, Cl. 382-18.000.

Payne, Thomas R., to General Electric Company. Cooking appliance incorporating heater energy counter means. 4,551,618, Cl. 219-510.000.

Peacock Investments (Proprietary) Limited: *See*—
Raubenheimer, Johann N., 4,550,463, Cl. 15-1.700.
Pecoraro, Theresa A.; Krug, Russell R.; and Deady, Joanne, to Chevron Research Company. Cracking of heavy hydrocarbons with improved yields of valuable liquid products. 4,551,229, Cl. 208-76.000.
PEI, Inc.: *See*—
Englehardt, Paul, 4,550,945, Cl. 296-100.000.
Pelley, Perry H., III, to Motorola, Inc. Sense amplifier. 4,551,641, Cl. 307-530.000.
Penn, Jack C.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; and Penn, Jack C., 4,551,766, Cl. 358-256.000.
Penn, James E.: *See*—
Hoke, Merle C.; Armstrong, Richard G.; and Penn, James E., 4,551,792, Cl. 362-362.000.
Pennella, Filippo: *See*—
Lin, Fan-Nan; and Pennella, Filippo, 4,551,444, Cl. 502-313.000.
Pennwalt Corporation: *See*—
Davidson, Thomas A.; and Murray, Robert J., 4,551,535, Cl. 546-121.000.
Penrose, Lee: *See*—
Carson, Donald W.; Penrose, Lee; Leich, Joseph E.; and Caugherty, William C., 4,550,455, Cl. 4-480.000.
Pensa, Inc.: *See*—
Stubblefield, Jerry D., 4,550,510, Cl. 36-32.00R.
Perkin-Elmer Corporation, The: *See*—
Hufnagel, Robert E., 4,550,973, Cl. 350-3.720.
Permut, Ronald; Cope, Robert; Apple, James; Epina, August P.; and Munro, Frederick G., to Storage Technology Corporation. Tape drive having swing arm buffers and automatic threading. 4,550,884, Cl. 242-189.000.
Pershin, Gely G.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.
Pershin, Grigory N.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.
Personal Products Company: *See*—
Kopolow, Steven L., 4,551,142, Cl. 604-368.000.
Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company (Ohio), The. Catalyst for upgrading synthesis gas. 4,551,442, Cl. 502-178.000.
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, to A. Menarini S.a.S. Tricyclic derivatives of 5,6-dihydro-11H-dibenzo (b,e) azepin-6-one having pharmacological activity. 4,551,451, Cl. 514-217.000.
Peterson, Francis C., to Illinois Tool Works Inc. Friction welded fastener system. 4,551,189, Cl. 156-73.500.
Petoia, Salvatore R., to United States of America, Navy. Multi-directional straddle-lift carrier. 4,551,059, Cl. 414-459.000.
Petry, Eston F.: *See*—
Coon, Julian B.; and Petry, Eston F., 4,551,041, Cl. 406-85.000.
Petrzilka, Martin; Schadt, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Liquid crystalline esters and mixtures. 4,550,981, Cl. 350-350.00R.
Pezzana, Francesco; and Quacquarella, Cesare, to W. R. Grace & Co., Cryovac Div. Apparatus for making multi-walled plastic bags. 4,551,125, Cl. 493-217.000.
Pfaff Industriemaschinen GmbH: *See*—
Dusch, Albert, 4,550,671, Cl. 112-235.000.
Pfister, Gustav: *See*—
Troup, Alan P.; Guttinger, Hannes; and Pfister, Gustav, 4,551,710, Cl. 340-505.000.
Pfizer Hospital Products Group, Inc.: *See*—
Kenna, Robert V., 4,550,448, Cl. 623-16.000.
Pfizer Inc.: *See*—
Cross, Peter E.; Dickinson, Roger P.; and Thomas, Geoffrey N., 4,551,468, Cl. 514-339.000.
Flick, Gary D.; and Reinshagen, John H., 4,551,219, Cl. 204-290.00R.
Marfat, Anthony, 4,551,452, Cl. 514-222.000.
Moore, Bernard S., 4,551,542, Cl. 549-401.000.
Pfoertner, Karlheinz: *See*—
Hansen, Hans-Jurgen; and Pfoertner, Karlheinz, 4,551,214, Cl. 204-159.000.
Phillip P. Rogers & Faye Rogers Living Trust: *See*—
Rogers, Phillip P., 4,551,146, Cl. 604-403.000.
Phillips, Donald W. Shoe apparatus and method. 4,550,462, Cl. 12-17.00R.
Phillips, Edwin D. Non-stick stopper with easy removal structure. 4,550,846, Cl. 215-296.000.
Phillips, James D.; and Sheets, Robert L., to J. D. Phillips Corporation. Milling machine. 4,551,048, Cl. 409-197.000.
Phillips Petroleum Company: *See*—
Cobb, Raymond L., 4,551,573, Cl. 585-459.000.
Kukes, Simon G.; and Nowack, Gerhard P., 4,551,230, Cl. 208-89.000.
Lin, Fan-Nan; and Pennella, Filippo, 4,551,444, Cl. 502-313.000.
Pierce, Phyllis J., 4,551,431, Cl. 435-176.000.
Porter, Randall A.; and Reed, Larry E., 4,551,227, Cl. 208-48.0AA.
Rush, Elton E., 4,550,621, Cl. 74-2.000.
Sadhukhan, Pasupati, 4,551,223, Cl. 208-8.00R.
Wishman, Marvin, 4,550,725, Cl. 128-155.000.
Pierce, Phyllis J., to Phillips Petroleum Company. The use of gallium and indium salts for the immobilization of proteins. 4,551,431, Cl. 435-176.000.
Pilot Man-Nen-Hisu Kabushiki Kaisha: *See*—
Sato, Morio; and Igawa, Tatsuya, 4,550,660, Cl. 101-128.210.
Pinckard, R. Neal: *See*—
Hanahan, Donald J.; and Pinckard, R. Neal, 4,551,446, Cl. 514-77.000.
Pioneer Electronic Corporation: *See*—
Aizawa, Koki; and Haeno, Akira, 4,551,642, Cl. 307-552.000.
Kurosaki, Masanori; and Kawamura, Katsuaki, 4,551,855, Cl. 455-161.000.
Matsuda, Kouichi; and Sato, Youichi, 4,551,755, Cl. 358-188.000.
Sakaguchi, Shouzaburou; and Ueki, Yoshiharu, 4,551,774, Cl. 360-72.100.
Tomita, Shuichi, 4,550,796, Cl. 181-141.000.
Piontkowski, Carl F. Combustor unit for woodburning stove. 4,550,668, Cl. 110-210.000.
Pipa, William; Warren, Robert F.; and Russack, Harvey, to Russack, Harvey. Device for producing decorative patterns on clothing. 4,550,679, Cl. 118-52.000.
Pirio, Marcel R.; and Singh, Prithipal, to Syntex (U.S.A.) Inc. Desmethylimipramine derivatives and poly(amino acid) conjugates. 4,551,275, Cl. 260-239.00D.
Pissiotas, Georg: *See*—
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,551,531, Cl. 544-320.000.
Plaas, Jon R.; Parker, Keith E.; Keiser, James D.; and Johnson, Elmer C., Jr., to Marion Laboratories, Inc. Method and apparatus for burn wound treatment. 4,551,139, Cl. 604-290.000.
Plastic Systems, Inc.: *See*—
Cohen, Lenard; and Gordon, Michael E., 4,551,783, Cl. 361-223.000.
Plastofilm Industries, Inc.: *See*—
Simmons, Richard J., 4,550,837, Cl. 211-126.000.
Plenty Limited: *See*—
Kain, Alexander S., 4,551,079, Cl. 418-26.000.
Plesscy Overseas Limited: *See*—
Reid, Douglas C. J.; and Stewart, William J., 4,551,020, Cl. 356-73.100.
Plies, Erich: *See*—
Lischke, Burkhard; and Plies, Erich, 4,551,625, Cl. 250-310.000.
Plotnick, Michael A.: *See*—
Palmer, Richard C.; and Plotnick, Michael A., 4,551,770, Cl. 358-342.000.
Pohl, Karl-Heinz, to Siemon Company, The. Wire connector with cutting edge. 4,550,969, Cl. 339-98.000.
Pointud, Bernard: *See*—
Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, 4,551,382, Cl. 428-258.000.
Polaroid Corporation: *See*—
Biber, Conrad H., 4,551,825, Cl. 367-101.000.
Hicks, John W., Jr., 4,551,162, Cl. 65-4.200.
Polifarma S.p.A.: *See*—
De Luca, Giovanna; Di Stazio, Giovanni; Politi, Vincenzo; and Materazzi, Mario, 4,551,471, Cl. 514-419.000.
Politechnika Warszawska: *See*—
Mroz, Andrzej; and Wronski, Stanislaw, 4,551,242, Cl. 209-211.000.
Politi, Vincenzo: *See*—
De Luca, Giovanna; Di Stazio, Giovanni; Politi, Vincenzo; and Materazzi, Mario, 4,551,471, Cl. 514-419.000.
Pollara, Paul: *See*—
Liberti, Paul A.; and Pollara, Paul, 4,551,435, Cl. 436-541.000.
Polukhina, Lidia M.: *See*—
Belykh, Sergei I.; Davydov, Anatoly B.; Kovalenko, Igor L.; Loktionova, Lidia Y.; Moschensky, Anatoly D.; Pershin, Gely G.; Pershin, Grigory N.; Padeiskaya, Elena N.; Polukhina, Lidia M.; Ochirov, Nikolai I.; and Filippov, Jury I., 4,550,723, Cl. 128-92.00B.
Porco, Frank, to Exquisite Form Industries, Inc. Brassiere. 4,550,734, Cl. 128-460.000.
Porter, Randall A.; and Reed, Larry E., to Phillips Petroleum Company. Antifoulants for thermal cracking processes. 4,551,227, Cl. 208-48.0AA.
Potage, Jean: *See*—
Deman, Pierre; and Potage, Jean, 4,551,853, Cl. 455-72.000.
Power Components Inc.: *See*—
Holley, David M., 4,550,899, Cl. 267-119.000.
PPG Industries, Inc.: *See*—
Retsch, William H.; and Zdziarski, Stanley F., 4,550,900, Cl. 269-87.000.
Savolskis, Edward P.; and Krumwiede, John F., 4,551,161, Cl. 65-27.000.
Prager, Irwin D. Life preserving equipment. 4,551,106, Cl. 441-94.000.
Precision Engineering Products Limited (Suffolk): *See*—
Giles, Alan F., 4,550,793, Cl. 177-145.000.
Precision Grinding Limited: *See*—
Fisher, John H.; and Ferdinandi, Frank, 4,551,795, Cl. 364-139.000.
Preston, Stephen W. Element removal tool for system carrying fluid under pressure. 4,550,481, Cl. 29-213.00R.

Prevorsek, Dusan C.: *See*—
Kavesh, Sheldon; and Prevorsek, Dusan C., 4,551,296, Cl. 264-177.00F.
Price, Anthony G.; and Campbell, Roy, to Lucas Industries public limited company. Disc brakes for vehicles. 4,550,810, Cl. 188-71.400.
Price, Dalby L. Router device. 4,551,047, Cl. 409-182.000.
Price, William J. Coin crossing game device. 4,550,913, Cl. 273-126.00R.
Pro/Pak Industries, Inc.: *See*—
Miller, R. Craig, 4,551,255, Cl. 210-770.000.
Pro-Tex Limited Partnership: *See*—
Fay, James P., Sr.; and Fay, James P., Jr., 4,550,861, Cl. 222-78.000.
Prochazka, Svante: *See*—
Johnson, Curtis A.; Renlund, Gary M.; Van Buren, Charles E.; and Prochazka, Svante, 4,551,436, Cl. 501-90.000.
Procter & Gamble Company, The: *See*—
Barker, Dale E.; Bettle, Griscom, III; and Van Coney, Robert H., 4,550,862, Cl. 222-109.000.
Gosselink, Eugene P., 4,551,506, Cl. 525-417.000.
Kock, Ronald W.; and Esposito, John A., 4,551,191, Cl. 156-276.000.
Nakel, Gunther M.; and Heckert, David C., 4,551,342, Cl. 426-548.000.
Proffit, John D. Golf caddy. 4,550,930, Cl. 280-655.000.
Prohaska, Hans: *See*—
Deutscher, Hans-Christian; Kohler, Alfred; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,550,469, Cl. 15-250.340.
Prokopp, Manfred: *See*—
Barth, Hans; and Prokopp, Manfred, 4,551,673, Cl. 324-158.00F.
Prop, Gerrit: *See*—
Hilboll, Gerd; Doppelfeld, Ille-Stephanie; and Prop, Gerrit, 4,551,455, Cl. 514-252.000.
Pruett, Roy L.: *See*—
Doyle, Gerald; Eriksen, Kenneth A.; and Pruett, Roy L., 4,551,543, Cl. 556-14.000.
Puebla-Ponce, Claudio G.: *See*—
Michl, Josef; and Puebla-Ponce, Claudio G., 4,551,819, Cl. 365-120.000.
Punja, Nazim, to Imperial Chemical Industries PLC. Halogenated esters. 4,551,546, Cl. 560-124.000.
Pyramid Optical, Inc.: *See*—
Buckley, Galen L.; and Fox, Paul L., 4,550,482, Cl. 29-412.000.
Quacquarella, Cesare: *See*—
Pezzana, Francesco; and Quacquarella, Cesare, 4,551,125, Cl. 493-217.000.
Quartztronics, Inc.: *See*—
EerNisse, Errol P., 4,550,610, Cl. 73-702.000.
Quercy, Alexandre P. L., to Societe Anonyme des Usines Chausson. Device for raising various loads, particularly trolleys for handicapped persons, on vehicles. 4,551,060, Cl. 414-541.000.
Quickie Manufacturing Corporation: *See*—
Strahs, Martin P., 4,550,829, Cl. 206-361.000.
Quist, Eric, to Branson Ultrasonics Corporation. Automatic tuning circuit for use in an ultrasonic apparatus. 4,551,690, Cl. 331-36.00L.
Radisch, Helmer; and Scholz, Werner, to Saint-Gobain Vitrage. Transparent, antifogging coating comprised of a plastic material containing a surface active agent. 4,551,484, Cl. 523-169.000.
Raffenberg, Bruno. Track clearing device for pushing apart rail vehicles. 4,550,897, Cl. 254-93.00R.
Ragan, Gary S.; and Jones, Jesse D., to Ethyl Corporation. Poly(ethylene terephthalate) blends. 4,551,485, Cl. 523-212.000.
Rainin Instrument Co. Inc.: *See*—
Shackelford, Carl L.; and Rainin, Kenneth, 4,551,249, Cl. 210-198.200.
Rainin, Kenneth: *See*—
Shackelford, Carl L.; and Rainin, Kenneth, 4,551,249, Cl. 210-198.200.
Rains, John K.: *See*—
Haeber, John A.; Rains, John K.; Beitler, Brad D.; and Kukuchek, George S., 4,550,936, Cl. 285-26.000.
Raley, Garland E.; and Goodrum, Richard W., to Ethyl Corporation. Sterilizable perforated packaging material. 4,550,546, Cl. 53-425.000.
Ralston Purina Company: *See*—
Josselson, Marc; and Henderson, Doug, 4,550,636, Cl. 83-743.000.
Shen, Jerome L., 4,551,274, Cl. 260-123.500.
Ramella, Amilcare; and Wang, Hsin-Ju, to Mobil Oil Corporation. Method for improving reformer yield selectivity. 4,551,228, Cl. 208-65.000.
Ramsden, Hugh E.; and Henry, Michael, to J. T. Baker Chemical Co. Acylated polyethylenimine bound chromatographic packing. 4,551,245, Cl. 210-198.200.
Rannenberg, George C., to United Technologies Corporation. Multiple load, high efficiency air cycle air conditioning system. 4,550,573, Cl. 62-172.000.
Rao, Srinivas T.; and Trager, Louis, to RCA Corporation. Bath and process for the electrodeposition of micromachinable copper and additive for said bath. 4,551,212, Cl. 204-52.00R.
Raschke, Klaus; and Exner, Gerhard, to Kraftwerke Union AG. Medium-pressure steam turbine. 4,551,063, Cl. 415-115.000.
Rascle, Roger: *See*—
Cornet, Jean; Lange , Francois; Le Carvennec, Francois; Lehureau, Jean-Claude; and Rascle, Roger, 4,551,733, Cl. 346-137.000.
Rashev, Michael. Biorhythms analog computer-calendar. 4,551,620, Cl. 235-1.00C.
Rasmussen, Robert, to Industrial Parts Depot. Replaceable wear-edge router bit. 4,550,513, Cl. 37-141.00R.
Rath, Gero: *See*—
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.
Rathmell, William G.: *See*—
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,551,469, Cl. 514-383.000.
Ratton, Serge; and Bougeois, Jean-Luc, to Rhone-Poulenc Specialites Chimiques. Bromination of substituted benzaldehydes. 4,551,557, Cl. 568-433.000.
Ratton, Serge; and Bougeois, Jean-Luc, to Rhone-Poulenc Specialites Chimiques. Bromination of substituted benzaldehydes. 4,551,558, Cl. 568-433.000.
Rau, Gunter: *See*—
Trispel, Stephan; and Rau, Gunter, 4,550,990, Cl. 351-243.000.
Raubenheimer, Johann N., to Peacock Investments (Proprietary) Limited. Steering device for a suction cleaning appliance. 4,550,463, Cl. 15-1.700.
Raue, Roderich: *See*—
Brinkwerth, Wolfgang; Huffer, Wolfgang; Raue, Roderich; Schieder, Rudolf; and Telle, Helmut, 4,551,265, Cl. 252-301.170.
Rawlings, David L., to International Hydron Corporation. Device for centrifugally casting articles. 4,551,086, Cl. 425-425.000.
RCA Corporation: *See*—
Bendell, Sidney L., 4,551,760, Cl. 358-213.000.
Derendinger, Max, 4,550,680, Cl. 118-308.000.
Gange, Robert A., 4,551,648, Cl. 313-37.000.
Levine, Peter A., 4,551,762, Cl. 358-221.000.
Meise, William H.; and Dischert, Robert A., 4,551,754, Cl. 358-180.000.
Palmer, Richard C.; and Plotnick, Michael A., 4,551,770, Cl. 358-342.000.
Pankove, Jacques I., 4,551,352, Cl. 427-39.000.
Rao, Srinivas T.; and Trager, Louis, 4,551,212, Cl. 204-52.00R.
Russell, John P.; and Goodman, Alvin M., 4,551,643, Cl. 307-570.000.
Rea, Samuel N.: *See*—
Wakefield, G. Felix; Bender, David L.; and Rea, Samuel N., 4,551,291, Cl. 264-104.000.
REB Manufacturing, Inc.: *See*—
Risner, Melvin G., 4,551,056, Cl. 414-539.000.
Recognition Equipment Incorporated: *See*—
Dreher, Carl T., 4,551,717, Cl. 340-712.000.
Redfield, James W.: *See*—
Charpentier, Albert J.; Redfield, James W.; and DiOrio, David W., 4,551,682, Cl. 328-22.000.
Redland Technology Limited: *See*—
Aston, Geoffrey W.; Smith, Susan; Chapman, Paul; and Barker, Howard A., 4,551,384, Cl. 428-312.600.
Redman, James; and Ellison, Joseph E., to Redman, James. Pipe hanger. 4,550,890, Cl. 248-59.000.
Redpath, James: *See*—
Savage, David S.; and Redpath, James, 4,551,479, Cl. 514-657.000.
Reed, Anthony R.: *See*—
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.
Reed, Larry E.: *See*—
Porter, Randall A.; and Reed, Larry E., 4,551,227, Cl. 208-48.0AA.
Reese, Edward W.: *See*—
Fletcher, Bruce W.; Rydell, Mark A.; and Reese, Edward W., 4,551,292, Cl. 264-139.000.
Reese, Vernon E.; and Schwierking, Roger A., to Henny Penny Corporation. Sifter for breading apparatus. 4,550,677, Cl. 118-31.000.
Rehmann, Robert, to Ems-Inventa AG. Safety device for ammunition. 4,550,661, Cl. 102-251.000.
Reich, Frederich R., to Kirin Beer Kabushiki Kaisha. Methods and apparatus for detecting residual liquid in containers. 4,551,627, Cl. 250-339.000.
Reich, Gunter, to Leybold-Heraeus GmbH. Turbomolecular pump suitable for performing counterflow leakage tests. 4,550,593, Cl. 73-40.700.
Reichmanis, Elsa: *See*—
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,551,416, Cl. 430-311.000.
Reid, Douglas C. J.; and Stewart, William J., to Plessey Overseas Limited. Optical apparatus for determining the index profile of an optical fibre. 4,551,020, Cl. 356-73.100.
Reinfeld, Nyles V.; and Valentine, Michael J. Apparatus and method of packing articles. 4,550,549, Cl. 53-447.000.
Reinicke, Raymond C. Nail clipper receptacle. 4,550,496, Cl. 30-124.000.
Reinshagen, John H.: *See*—
Flick, Gary D.; and Reinshagen, John H., 4,551,219, Cl. 204-290.00R.
Reiss, Gerald; and Schneider, Rudolf. Steam iron. 4,550,514, Cl. 38-77.810.
Reith, Walter: *See*—
Walter, Lothar; and Reith, Walter, 4,550,479, Cl. 29-148.40C.
Reliance Electric Company: *See*—
Kammiller, Neil A., 4,551,668, Cl. 323-234.000.
Remmele, Bernhard: *See*—
Kuhlmann, Gerhard; and Remmele, Bernhard, 4,550,500, Cl. 30-392.000.
Remus, Casimer F., to Allied Corporation. Hermetically sealed drive. 4,550,630, Cl. 74-800.000.

Renlund, Gary M.; and Johnson, Curtis A., to General Electric Company. Thermoplastic molding of sinterable silicon carbide. 4,551,496, Cl. 524-322.000.

Renlund, Gary M.: *See—*
Johnson, Curtis A.; Renlund, Gary M.; Van Buren, Charles E.; and Prochazka, Svante, 4,551,436, Cl. 501-90.000.

Rensselaer Polytechnic Institute: *See—*
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,017, Cl. 356-28.500.
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,018, Cl. 356-28.500.

Resele, Peter, to Steyr-Daimler-Puch Aktiengesellschaft. Frame for two-wheeled vehicles. 4,550,927, Cl. 280-281.00R.

Retsch, William H.; and Zdziarski, Stanley F., to PPG Industries, Inc. Holding device for segmenting a workpiece. 4,550,900, Cl. 269-87.000.

Reuter, William: *See—*
Scala, John; and Reuter, William, 4,551,689, Cl. 331-2.000.

Rexroth, Frederick W., to Medical Research Associates, Ltd. #2. Electrosurgical generator. 4,550,727, Cl. 128-303.140.

Rey, Pierre: *See—*
De Raco, Maurice; and Rey, Pierre, 4,551,593, Cl. 200-81.00R.

Reymond, Jean C., to Thomson CSF. Head-mounted or helmet-mounted sighting device. 4,550,984, Cl. 350-404.000.

Reynolds, Joseph D.: *See—*
Lauer, Ernst H.; and Reynolds, Joseph D., 4,550,627, Cl. 74-475.000.

RFL Industries, Inc.: *See—*
Seely, Earle S.; and LaValley, Roger O., 4,551,782, Cl. 361-151.000.

Rhee, Byung Y. D.C. Motor with centrifugal separation starting brush. 4,551,658, Cl. 318-254.000.

Rhein-Chemie Rheinau GmbH: *See—*
Sauerbier, Michael; and Ehrend, Helfried, 4,551,505, Cl. 525-346.000.

Rheinmetall GmbH: *See—*
Bethmann, Karl W., 4,551,287, Cl. 269-3.00R.

Rhoads, Roger R., to Owens-Illinois, Inc. Bottle carrier. 4,550,824, Cl. 206-150.000.

Rhone-Poulenc, Inc.: *See—*
Theissen, Robert J., 4,551,171, Cl. 71-121.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Gagne, Pierre; Girardeau, Yvette; and Pointud, Bernard, 4,551,382, Cl. 428-258.000.
Ratton, Serge; and Bougeois, Jean-Luc, 4,551,557, Cl. 568-433.000.
Ratton, Serge; and Bougeois, Jean-Luc, 4,551,558, Cl. 568-433.000.

Riba-Pruftechnik GmbH: *See—*
Barth, Hans; and Prokopp, Manfred, 4,551,673, Cl. 324-158.00F.

Rice, Ivan G. Method of steam cooling a gas generator. 4,550,562, Cl. 60-39.020.

Rich, Donald S., to Parlex Corporation. Flat embedded-shield multiconductor signal transmission cable, method of manufacture and method of stripping. 4,551,576, Cl. 174-36.000.

Rich, Hubert A.; Saffer, Gary M.; and Sestito, William F., to Mattel, Inc. Toy structural member roller. 4,551,127, Cl. 493-462.000.

Rich Products Corporation: *See—*
O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., 4,551,348, Cl. 426-639.000.

Richard, Henry J.: *See—*
Gidge, Kenneth N.; and Richard, Henry J., 4,550,760, Cl. 160-328.000.

Richards, Alwyn H.: *See—*
Whitlam, Joseph E.; and Richards, Alwyn H., 4,550,541, Cl. 52-309.800.

Riches, Arthur J.; and Mitchell, Brian, to Allied Corporation. Electrical connector member. 4,550,967, Cl. 339-88.00R.

Richey, Daniel D.: *See—*
Stahura, Daniel W.; and Richey, Daniel D., 4,551,630, Cl. 290-38.00R.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.

Richter, Johannes: *See—*
Bottcher, Hugo; Heimrich, Klaus; Hildebrandt, Gustav; Kracke, Heinrich; and Richter, Johannes, 4,551,297, Cl. 264-224.000.

Richter, Kurt W.: *See—*
La Bonte, David E.; Richter, Kurt W.; and Goehler, Robert F., 4,550,622, Cl. 74-87.000.

Ricoh Company Ltd.: *See—*
Anderson, Carl P., 4,550,999, Cl. 355-3.0TR.
Inokuchi, Toshiyuki, 4,551,737, Cl. 346-161.000.
Koichi, Yasushi, 4,551,005, Cl. 355-8.000.
Maruta, Keiichi; and Yuyama, Yukihiro, 4,551,738, Cl. 346-200.000.
Nishi, Kohichi; and Takahashi, Akira, 4,550,997, Cl. 354-459.000.

Rieck, James N.: *See—*
Yeater, Robert P.; Pantone, Richard S.; and Rieck, James N., 4,551,498, Cl. 524-424.000.

Rieder, Heinz; and Schwaiger, Max. Instrument for measuring lengths. 4,550,505, Cl. 33-125.00C.

Riederer, Stephen J.; and Keyes, Gary S., to General Electric Company. Integrated hybrid image remasking in a subtraction angiography method. 4,551,800, Cl. 364-414.000.

Riegel, Ulrich: *See—*
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.

Riehl, Tilford F., Jr., to Brown & Williamson Tobacco Corporation. Mouthpiece for a cigarette and a cigarette having same. 4,550,740, Cl. 131-336.000.

Riley, Roy C., to J & R Manufacturing, Inc. Electrical cable connectors. 4,550,966, Cl. 339-84.000.

Riley, Thomas C., Jr.; Tharp, Charles P.; and Lapka, Galen G., to KV Pharmaceutical Company. Vaginal delivery systems and their methods of preparation and use. 4,551,148, Cl. 604-890.000.

Risner, Melvin G., to REB Manufacturing, Inc. Automatic handrail for platform lift. 4,551,056, Cl. 414-539.000.

Rittal-Werk Rudolf Loh GmbH & Co. KG: *See—*
Laudt, Jurgen, 4,550,852, Cl. 220-327.000.

Rittersdorf, Walter: *See—*
Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, 4,551,428, Cl. 435-19.000.

Ritz, Josef: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,551,318, Cl. 423-265.000.

Rizkalla, Nabil M., to Halcon SD Group, Inc., The. Thermally-induced hydrolysis of acetal. 4,551,560, Cl. 568-465.000.

Roach, Stewart W.: *See—*
Hagedorn, Stanley R.; and Roach, Stewart W., 4,551,042, Cl. 406-93.000.

Roalson, Howard J., to International Business Machines Corporation. Automatic reference adjustment for position error signal on disk file servo system. 4,551,776, Cl. 360-77.000.

Robbart, Edward. Method for printing cellulosic substrates using modified reactive siloxanes to form an oleophilic layer thereon and impregnating thereafter with an ink. 4,551,385, Cl. 428-323.000.

Robbins, Gordon B., to Du Pont de Nemours, E. I., and Company. Titanium ester compositions having depressed freezing points. 4,551,544, Cl. 556-40.000.

Robbins, Keith V.: *See—*
Cox, Anthony F.; Glanville, Roger; Lloyd, Owen; and Robbins, Keith V., 4,550,591, Cl. 73-28.000.

Robert, Alain: *See—*
Ouhayoun, Michel; and Robert, Alain, 4,551,843, Cl. 372-87.000.

Robert Bosch GmbH: *See—*
Barho, Hans; and Denz, Helmut, 4,550,704, Cl. 123-481.000.
Kuhlmann, Gerhard; and Remmele, Bernhard, 4,550,500, Cl. 30-392.000.
Leiber, Heinz, 4,550,954, Cl. 303-92.000.

Roberts, John T., to UOP Inc. Bis-(p-amino-heteroarylmethyl)anilines as antioxidants. 4,551,536, Cl. 546-264.000.

Robotics, Inc.: *See—*
Mosher, Ralph S., 4,551,058, Cl. 414-735.000.

Robson, John H.; and Keller, George E., II, to Union Carbide Corporation. Process for the production of alkylene glycols. 4,551,766, Cl. 568-867.000.

Roby, Charles K.: *See—*
Fletcher, George R., Jr.; Messick, George H., Jr.; Roby, Charles K.; and Huey, Cecil O., Jr., 4,550,532, Cl. 51-288.000.

Roch, Josef: *See—*
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,551,464, Cl. 514-312.000.

Rock-Tenn Co.: *See—*
Fletcher, Richard J.; and Wischusen, Henry, III, 4,550,834, Cl. 206-611.000.

Rocklin, Isadore J. Device and method for surfacing a workpiece. 4,551,603, Cl. 219-76.130.

Rockwell International Corporation: *See—*
Craiglow, Robert L., 4,551,688, Cl. 330-280.000.
Huffman, Charles E., 4,551,830, Cl. 370-15.000.
Olson, Roy E., 4,551,649, Cl. 313-336.000.

Roe, James E.: *See—*
Gellman, Gary; Erburt, George A.; and Roe, James E., 4,551,343, Cl. 426-549.000.

Roebke, Wolfgang: *See—*
Strack, Hans; Roebke, Wolfgang; Kneitel, Dieter; and Parr, Ehrfried, 4,551,322, Cl. 423-329.000.

Roeder, Robert S.; and Sterghos, Peter M., to Sperry Corporation. Apparatus for rapid switch conical scan feed. 4,551,728, Cl. 343-761.000.

Roemer, Karl H.: *See—*
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.

Roemmele, Carl F.; and Ekland, Joseph D., to Federal-Mogul Corporation. Abrasive cutting wheel for cutting rock-like material. 4,550,708, Cl. 125-15.000.

Rogers, Charles J.: *See—*
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and Rogers, Charles J., 4,551,218, Cl. 204-240.000.

Rogers, Jerrold J., to Tektronix, Inc. Method and apparatus for modulating the recording rate of an image on the recording media of a line scan graphic recorder with the velocity of the recording media. 4,551,732, Cl. 346-110.00R.

Rogers, Phillip P., to Phillip P. Rogers & Faye Rogers Living Trust; and Uatar DTD., Phillip P. Rogers & Faye Rogers, co-trustees. Connector for ambulatory dialysis system. 4,551,146, Cl. 604-403.000.

Rohlik, John W. Crop guiding attachment for a combine divider. 4,550,555, Cl. 56-314.000.

Rohn, Charles L., to Mobil Oil Corporation. Biaxially oriented films of butene-1 homopolymer and copolymers. 4,551,514, Cl. 526-348.100.

Rolls-Royce Inc.: *See*—
Szuminski, Gary F., 4,550,877, Cl. 239-265.350.

Rolls-Royce Limited: *See*—
Geary, Alan P., 4,551,062, Cl. 415-115.000.
Pask, George, 4,551,064, Cl. 415-116.000.

Romak, Paul E., to AMP Incorporated. Cylindrical socket contact. 4,550,972, Cl. 339-256.00R.

Romer, Michael: *See*—
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, 4,551,264, Cl. 252-299.620.

Roper, Colleen F. Footstool with inclined ramp. 4,550,802, Cl. 182-113.000.

Rosback, Martin D.: *See*—
Causley, Gary C.; and Rosback, Martin D., 4,551,734, Cl. 346-140.00R.

Rose, Jochen, to International Standard Electric Corporation. Rotary switch for printed circuit boards. 4,551,587, Cl. 200-11.00R.

Rosenberg, Avner: *See*—
Rosenberg, Peretz; and Rosenberg, Avner, 4,550,878, Cl. 239-542.000.

Rosenberg, Peretz; and Rosenberg, Avner. Drip irrigator with pressure responsive flow regulator. 4,550,878, Cl. 239-542.000.

Rosenbluth, Robert F.: *See*—
Seiler, Louis, Jr.; and Rosenbluth, Robert F., 4,550,447, Cl. 623-1.000.

Rosenquist, Joel C.: *See*—
Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., 4,550,670, Cl. 112-121.110.

Rosenstock, Winfried. Method of driving steel profiles into a rock substratum. 4,550,786, Cl. 175-2.000.

Rosenwinkel, Donald A.: *See*—
Kulesza, Ralph J.; Rosenwinkel, Donald A.; and Disko, Harry, 4,550,876, Cl. 239-211.000.

Roshon-Larsen, Gwynne L.: *See*—
Amdahl, Gene M.; Hanson, Donald L.; Kreuzenstein, Ronald K.; Roshon-Larsen, Gwynne L.; and Woffinden, Gary A., 4,551,797, Cl. 364-200.000.

Ross, William E., to Litton Systems, Inc. Magneto-optic device for the control of electromagnetic radiation. 4,550,983, Cl. 350-376.000.

Rotaque (Proprietary) Limited: *See*—
Brouwer, Cornelis, 4,550,665, Cl. 105-241.200.

Rottler, Donald; and Engnell, David, to Rottler Manufacturing Co. Short-stroking honing machine. 4,550,530, Cl. 51-34.00R.

Rottler Manufacturing Co.: *See*—
Rottler, Donald; and Engnell, David, 4,550,530, Cl. 51-34.00R.

Rottmaier, Ludwig: *See*—
Schellhammer, Karl-Wolfgang; Rottmaier, Ludwig; Merten, Rudolf; and Schimmel, Ulrich, 4,551,263, Cl. 252-186.390.

Roussel Uclaf: *See*—
Frank-Neumann, Michel; Sedrati, Madjid; Vigneron, Jean-Pierre; and Bloy, Vincente, 4,551,545, Cl. 560-124.000.

Rowen, Christopher M.: *See*—
Rowen, John B.; Rowen, Christopher M.; and Janusis, Charles, 4,551,028, Cl. 368-204.000.

Rowen, John B.; Rowen, Christopher M.; and Janusis, Charles. Disposable electronic watch. 4,551,028, Cl. 368-204.000.

Rozsi, Donald J.: *See*—
Smith, Stanley K.; and Rozsi, Donald J., 4,551,808, Cl. 364-474.000.

RTC Industries, Inc.: *See*—
Nathan, Walter; and Zucker, Armand S., 4,550,838, Cl. 211-128.000.

Rudin, Richard E., to S. C. Johnson & Son, Inc. Easily dispersible dietary fiber product and method for producing the same. 4,551,331, Cl. 424-195.100.

Rudolf, Peter: *See*—
Lehner, August; Hack, Joachim; Krucker, Karl; Balz, Werner; Roemer, Karl H.; Rudolf, Peter; Falk, Roland; and Eckert, Guenter, 4,551,359, Cl. 427-130.000.

Rumsey, Steven C., to American Standard Inc. Manually releasable parking brake device. 4,550,811, Cl. 188-170.000.

Runyon, Wayne; and Hower, Larry, to L. P. Systems Corporation. Epilator. 4,550,728, Cl. 128-303.180.

Rupp, Jody W.: *See*—
Owensby, Joseph E.; Rupp, Jody W.; Dobbins, Frederick A.; and Waldrop, Thomas E., 4,550,548, Cl. 53-434.000.

Ruppel, Peter: *See*—
Schaut, Josef; and Ruppel, Peter, 4,551,012, Cl. 355-50.000.

Rush, Elton E., to Phillips Petroleum Company. Container piercing device. 4,550,621, Cl. 74-2.000.

Russack, Harvey: *See*—
Pipa, William; Warren, Robert F.; and Russack, Harvey, 4,550,679, Cl. 118-52.000.

Russell, John P.; and Goodman, Alvin M., to RCA Corporation. Power switching circuitry. 4,551,643, Cl. 307-570.000.

Russo, Frank D.: *See*—
Leech, Edward J.; and Russo, Frank D., 4,551,488, Cl. 523-427.000.

Ruston, Donald A.: *See*—
Campbell, James R., 4,551,604, Cl. 219-78.120.

Ruti-te Strake B.V.: *See*—
Manders, Petrus G. J., 4,550,752, Cl. 139-435.000.

Rutili, Renzo N.: *See*—
Hamilton, Lawrence E.; and Rutili, Renzo N., 4,551,598, Cl. 200-314.000.

Rutty, John G.; and Arndt, Alfred. Anti-blocking device including stuck microphone reliever for aircraft voice communication system. 4,551,854, Cl. 455-78.000.

Ruzicka, Alan V., to McCulloch Corporation. String trimmer with cut line retention pocket. 4,550,499, Cl. 30-276.000.

Ryan, Charles P.; and Guenthner, Russell W., to Honeywell Information Systems Inc. Verification of real page numbers of stack stored prefetched instructions from instruction cache. 4,551,799, Cl. 364-200.000.

Ryan, Lizabeth L. Sanitary napkin. 4,551,145, Cl. 604-389.000.

Rydell, Mark A.: *See*—
Fletcher, Bruce W.; Rydell, Mark A.; and Reese, Edward W., 4,551,292, Cl. 264-139.000.

S. C. Johnson & Son, Inc.: *See*—
Francis, Alan W., 4,550,676, Cl. 116-206.000.
Rudin, Richard E., 4,551,331, Cl. 424-195.100.

S-P Manufacturing Corporation, The: *See*—
Hall, William E.; Gailey, Edward D.; and Ovanin, George J., 4,550,922, Cl. 279-119.000.

Sabacky, Bruce J.; and Hepworth, Malcolm T., to Amax Inc. Flash sublimation and purification of molybdenum oxide. 4,551,313, Cl. 423-59.000.

Sablev, Leonid P.: *See*—
Axenov, Ivan I.; Bren, Viktor G.; Padalka, Valentin G.; Sablev, Leonid P.; Stupak, Rimma I.; and Khoroshikh, Vladimir M., 4,551,221, Cl. 204-298.000.

Sach, George S.: *See*—
Cooper, David G.; and Sach, George S., 4,551,466, Cl. 514-318.000.

Sadhukhan, Pasupati, to Phillips Petroleum Company. Thermal flashing of carbonaceous materials. 4,551,223, Cl. 208-8.00R.

Sado, Ichiro; Kishimoto, Juji; Sasaki, Masayuki; and Cho, Mitsuo, to Canon Kabushiki Kaisha. Electronic apparatus for translating one language into another. 4,551,818, Cl. 364-900.000.

Saffer, Gary M.: *See*—
Rich, Hubert A.; Saffer, Gary M.; and Sestito, William F., 4,551,127, Cl. 493-462.000.

Saigo, Kazuhide: *See*—
Suzuki, Masayoshi; and Saigo, Kazuhide, 4,551,417, Cl. 430-316.000.

Saint-Gobain Vitrage: *See*—
Kunert, Heinz, 4,551,372, Cl. 428-38.000.
Radisch, Helmer; and Scholz, Werner, 4,551,484, Cl. 523-169.000.

Saito, Susumu: *See*—
Fujii, Yasuhiko; Owaki, Isao; Saito, Susumu; Mori, Takaro; and Nakamura, Shinji, 4,551,840, Cl. 371-38.000.

Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, to Hitachi, Ltd. Tracking servo system for magnetic recording and reproducing apparatus using flexible magnetic disk. 4,551,777, Cl. 360-77.000.

Saito, Tomotaka; and Nagao, Kenichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Display control for electronic calculator. 4,551,716, Cl. 340-711.000.

Saito, Toshio: *See*—
Nagatani, Toshio; Chiba, Norio; Hatanaka, Takao; and Saito, Toshio, 4,551,367, Cl. 428-35.000.

Sajic, Branko: *See*—
Wagman, Julius; and Sajic, Branko, 4,551,330, Cl. 424-59.000.

Sakaguchi, Shouzaburou; and Ueki, Yoshiharu, to Pioneer Electronic Corporation. Method for selecting desired piece of information recorded in magnetic tape mounted in magnetic tape recorder and/or reproducer. 4,551,774, Cl. 360-72.100.

Sakakibara, Yasuyuki: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,550,744, Cl. 137-80.000.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling stall speed for an electromagnetic clutch. 4,550,816, Cl. 192-0.052.

Sakamoto, Junichi; Fujimoto, Hiroshi; and Miyake, Hideo, to Toyo Boseki Kabushiki Kaisha. Curable resin composition. 4,551,215, Cl. 204-159.230.

Sakamoto, Takao, to Tachikawa Spring Co., Ltd. Lumbar support device. 4,550,949, Cl. 297-284.000.

Sakurai, Terushige: *See*—
Abe, Toshio; and Sakurai, Terushige, 4,550,588, Cl. 72-441.000.

Salansky, Werner, to Stabeg Apparatebaugesellschaft m.b.H. Recessed lamp. 4,551,791, Cl. 362-296.000.

Salihar, Mark W., to Dearborn Chemical Co. Dust suppression with elastomer-containing foam. 4,551,261, Cl. 252-88.000.

Salls, David J.: *See*—
Bolton, Joseph A.; and Salls, David J., 4,551,202, Cl. 162-198.000.

Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M. Composition for preventing deposition of inorganic salts. 4,551,262, Cl. 252-181.000.

Sampei, Tohru: *See*—
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.

Sanbayashi, Takeshi; and Matsumoto, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Jam detector. 4,551,813, Cl. 364-569.000.
Sanchez, Pierre; and Laudat, Pierre, to CdF Chimie Azote et Fertilisants, S.A. Two-stage concentration for superphosphoric acid. 4,551,319, Cl. 423-316.000.
Sancier, Kenneth M.: *See*—
Wood, Bernard J.; Brittain, Robert D.; and Sancier, Kenneth M., 4,551,155, Cl. 48-197.00R.
Sandell, Sven. Imitation candle with magnetic pendulum. 4,551,794, Cl. 362-392.000.
Sanden Corporation: *See*—
Hiraga, Masaharu, 4,551,078, Cl. 418-16.000.
Sato, Tadashi; and Hiraga, Masaharu, 4,551,081, Cl. 418-55.000.
Sanders, Eugene T., to Southwire Company. Quick adjusting rolling mill. 4,550,583, Cl. 72-247.000.
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., to Mead Corporation, The. Transfer imaging system. 4,551,407, Cl. 430-138.000.
Sandhaus, Jeffrey. Closure having integral formed sealing means. 4,550,841, Cl. 215-211.000.
Sandherr Packungen AG: *See*—
Schellenberg, Walter, 4,550,854, Cl. 220-468.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,550,578, Cl. 68-5.00E.
Sando, Tomoji: *See*—
Iizuka, Eiichi; Sando, Tomoji; Kashima, Shinji; and Maki, Masakazu, 4,551,195, Cl. 156-603.000.
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Apparatus for low-temperature plasma treatment of a textile product. 4,550,578, Cl. 68-5.00E.
Sandoz, Inc.: *See*—
Kelly, Lawrence A., 4,551,288, Cl. 264-4.600.
Sanner, Axel: *See*—
Straub, Ferdinand; Sanner, Axel; Seib, Karl; and Lang, Siegfried, 4,551,512, Cl. 526-264.000.
Sannomiya, Kunio: *See*—
Tsuchiya, Hiroyoshi; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Otsuka, Hirotaka, 4,551,768, Cl. 358-283.000.
Sano, Sadao: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, 4,551,602, Cl. 219-69.00D.
Sano, Yoshiaki: *See*—
Nishimori, Eiji; Tsuchiya, Chikara; and Sano, Yoshiaki, 4,551,644, Cl. 307-573.000.
Sano, Yumiko: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,551,403, Cl. 430-58.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Iwashita, Takashi; Atsumi, Shinya; and Nakahama, Ryoji, 4,551,104, Cl. 440-56.000.
Santangelo, John A.; and DiGiantommaso, Michael, to Codman & Shurtleff, Inc. Endoscope insertion cannula assembly. 4,550,715, Cl. 128-4.000.
Santarelli, Paul: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,550,956, Cl. 312-250.000.
Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Mino, Hisashi; and Iizima, Takeshi, 4,551,408, Cl. 430-141.000.
Sapi, Janos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.
Sapru, Krishna; Hong, Kuochih; Fetcenko, Michael A.; and Venkatesan, Srinivasan, to Energy Conversion Devices, Inc. Hydrogen storage materials and methods of sizing and preparing the same for electrochemical applications. 4,551,400, Cl. 429-94.000.
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, to Mitsubishi Petrochemical Co., Ltd. Production of alkenylbenzenes. 4,551,571, Cl. 585-440.000.
Sasaki, Akira: *See*—
Hirao, Katsumi; and Sasaki, Akira, 4,550,865, Cl. 222-402.210.
Sasaki, Haruyoshi: *See*—
Sasaki, Makoto; Sasaki, Haruyoshi; and Sato, Hisato, 4,551,280, Cl. 260-465.00D.
Sasaki, Makoto; Sasaki, Haruyoshi; and Sato, Hisato, to Dainippon Ink and Chemicals, Inc. Nematic liquid crystalline compounds. 4,551,280, Cl. 260-465.00D.
Sasaki, Masayuki: *See*—
Sado, Ichiro; Kishimoto, Juji; Sasaki, Masayuki; and Cho, Mitsuo, 4,551,818, Cl. 364-900.000.
Sasaki, Naoyoshi. Device for holding a workpiece in a press. 4,550,585, Cl. 72-351.000.
Sasaki, Takashi: *See*—
Kimura, Toshihiko; Kaneko, Yutaka; and Sasaki, Takashi, 4,551,422, Cl. 430-551.000.
Sasakura, Kazuyuki: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; and Sasakura, Kazuyuki, 4,551,554, Cl. 568-322.000.
Sase, Masatoshi; and Yamanaka, Seisuke, to Sony Corporation. Signal processing circuit including image sensor. 4,551,761, Cl. 358-213.000.
Satake, Keigo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.
Satake, Masaki: *See*—
Tomiyama, Hideki; and Satake, Masaki, 4,551,410, Cl. 430-215.000.
Sato, Eiji: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Hirai, Kazuo; Miyasaka, Kingo; and Izumi, Masayoshi, 4,551,393, Cl. 428-609.000.
Sato, Hideo: *See*—
Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, 4,550,612, Cl. 73-727.000.
Sato, Hiroshi; and Nakamura, Shuzo, to Sumitomo Chemical Company, Limited. Process for nitration of benzene. 4,551,568, Cl. 568-939.000.
Sato, Hisato: *See*—
Sasaki, Makoto; Sasaki, Haruyoshi; and Sato, Hisato, 4,551,280, Cl. 260-465.00D.
Sato, Masanori; and Iizima, Kazuo, to Nitto Boseki Co., Ltd. Glass cloth with thin reinforced joints. 4,551,375, Cl. 428-57.000.
Sato, Minoru: *See*—
Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, 4,550,480, Cl. 29-156.40R.
Sato, Mitsuru: *See*—
Ishigami, Sumiyuki; and Sato, Mitsuru, 4,550,475, Cl. 29-25.350.
Sato, Morio; and Igawa, Tatsuya, to Pilot Man-Nen-Hisu Kabushiki Kaisha. Stencil. 4,550,660, Cl. 101-128.210.
Sato, Tadashi; and Hiraga, Masaharu, to Sanden Corporation. Pulley mechanism for fluid displacement apparatus. 4,551,081, Cl. 418-55.000.
Sato, Takeshi: *See*—
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.
Sato, Yoshimitsu: *See*—
Ogawa, Hisashi; Tanaka, Yasushi; and Sato, Yoshimitsu, 4,550,923, Cl. 280-5.00A.
Sato, Youichi: *See*—
Matsuda, Kouichi; and Sato, Youichi, 4,551,755, Cl. 358-188.000.
Satoh, Masato, to Fuji Xerox Co., Ltd. Picture image processing magnetic disc controlling method and apparatus therefor. 4,551,769, Cl. 358-296.000.
Satonaka, Shinobu: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, 4,551,009, Cl. 355-15.000.
Sauerbier, Michael; and Ehrend, Helfried, to Rhein-Chemie Rheinau GmbH. Process for crosslinking chlorinated polyethylene. 4,551,505, Cl. 525-346.000.
Saur, Roland, to Behr-Thomson Dehnstoffregler GmbH. Temperature control arrangement for combustion engine. 4,550,693, Cl. 123-41.100.
Savage, David S.; and Redpath, James, to Akzo N.V. Compounds with anti-convulsive properties. 4,551,479, Cl. 514-657.000.
Saverse, Ronald R.; and Jones, Harold T., to Sturtevant, Inc. Particle classifier. 4,551,241, Cl. 209-148.000.
Savolskis, Edward P.; and Krumwiede, John F., to PPG Industries, Inc. Organic wetting of glass batch. 4,551,161, Cl. 65-27.000.
Sawada, Daisaku: *See*—
Sugaya, Masami; Sawada, Daisaku; and Okawa, Susumu, 4,551,119, Cl. 474-28.000.
Sawyer, Wilbur H.: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,551,445, Cl. 514-9.000.
Sayler, William M., to United States of America, Army. Jet engine decontamination system. 4,551,092, Cl. 432-32.000.
Scala, John; and Reuter, William, to Comtech Telecommunications Corp. RF Local oscillator with low phase noise. 4,551,689, Cl. 331-2.000.
Scanes, Malcolm K.: *See*—
Hodges, Michael J.; and Scanes, Malcolm K., 4,550,868, Cl. 223-43.000.
Scarton, Henry A.: *See*—
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,017, Cl. 356-28.500.
Mannava, Seetha R.; McDonald, John F.; and Scarton, Henry A., 4,551,018, Cl. 356-28.500.
Schadt, Martin: *See*—
Petrzilka, Martin; Schadt, Martin; and Villiger, Alois, 4,550,981, Cl. 350-350.00R.
Schaedlich, Gunther; and Moraw, Roland, to Hoechst Aktiengesellschaft. Electrophotographic recording process and photoconductive coating suitable for use therein. 4,551,406, Cl. 430-119.000.
Schaefer, Ernst-Dieter, to ITT Industries Incorporated. Tandem master cylinder for hydraulically operated vehicular brakes. 4,550,567, Cl. 60-562.000.
Schaffer, Rudolf, to Compagnie des Montres Longines Francillon S.A. System for identification and determination of the moment of passage of a multiple number of moving bodies at a given point on their path. 4,551,725, Cl. 343-6.5SS.
Schaty, Harald, to USM Corporation. Plastic pipe clip. 4,550,891, Cl. 248-68.100.
Schatzka, Richard L.: *See*—
Cookson, John A.; Schatzka, Richard L.; Echard, Richard A.; and Scheer, Gary W., 4,551,718, Cl. 340-825.160.
Schaut, Josef; and Ruppel, Peter. Microfilm camera for filming punch cards. 4,551,012, Cl. 355-50.000.

Scheer, Gary W.: *See*—
Cookson, John A.; Schatzka, Richard L.; Echard, Richard A.; and Scheer, Gary W., 4,551,718, Cl. 340-825.160.

Schellenberg, Walter, to Sandherr Packungen AG. Deep-drawn conical plastic container and method of making. 4,550,854, Cl. 220-468.000.

Schellhammer, Karl-Wolfgang; Rottmaier, Ludwig; Merten, Rudolf; and Schimmel, Ulrich, to Bayer Aktiengesellschaft. Triazolidine-3,5-diones as activators for per-compounds. 4,551,263, Cl. 252-186.390.

Schemmel, Gerald; and Linnebach, Richard, to International Standard Electric Corporation. Method of making GaInAsP layers for photodetectors. 4,551,186, Cl. 148-171.000.

Schering Corporation: *See*—
Sherlock, Margaret H., 4,551,463, Cl. 514-300.000.

Schettler, Helmut; and Stadler, Ewald, to International Business Machines Corporation. Multilayer ceramic substrates with several metallization planes. 4,551,789, Cl. 361-406.000.

Scheurer, Robert S.; and Scheurer, Stephen M. Flotation garment. 4,551,107, Cl. 441-112.000.

Scheurer, Stephen M.: *See*—
Scheurer, Robert S.; and Scheurer, Stephen M., 4,551,107, Cl. 441-112.000.

Schieder, Rudolf: *See*—
Brinkwerth, Wolfgang; Huffer, Wolfgang; Raue, Roderich; Schieder, Rudolf; and Telle, Helmut, 4,551,265, Cl. 252-301.170.

Schimmel, Ulrich: *See*—
Schellhammer, Karl-Wolfgang; Rottmaier, Ludwig; Merten, Rudolf; and Schimmel, Ulrich, 4,551,263, Cl. 252-186.390.

Schipper, Edgar S.: *See*—
Shalaby, Shalaby W.; and Schipper, Edgar S., 4,550,730, Cl. 128-335.500.

Schiwiora, Harry: *See*—
Wagner, Rudolph; and Schiwiora, Harry, 4,551,302, Cl. 420-464.000.

Schlademan, James A., to Atlantic Richfield Company. Acrylic hot melt pressure sensitive adhesive coated sheet material. 4,551,388, Cl. 428-355.000.

Schlimper, Hans-Ulrich: *See*—
Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,551,321, Cl. 423-329.000.

Schmalbein, Dieter: *See*—
Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, 4,551,694, Cl. 333-24.00C.

Schmeitz, Axel W.: *See*—
Harms, Engelbert G.; Schmeitz, Axel W.; and Thomaschewski, Hubertus P., 4,551,362, Cl. 427-180.000.

Schmit, Justin M.; and Luoma, Eugene H., to Jeno's, Inc. Fried pizza product and process for preparing same. 4,551,337, Cl. 426-94.000.

Schmitt, Claude: *See*—
Merchant, Kamal; and Schmitt, Claude, 4,551,709, Cl. 340-347.0DA.

Schmitz, Gunther, to Taprogge Gesellschaft mbH. Cleaning elements for inside cleaning of the tubes of tube-type heat exchangers and method of manufacturing same. 4,550,466, Cl. 15-104.06R.

Schnabel, Wolfram: *See*—
Asmussen, Frithjof; Sotobayashi, Hideto; Chen, Jiang-Tsun; and Schnabel, Wolfram, 4,551,414, Cl. 430-270.000.
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.

Schneider, Rudolf: *See*—
Reiss, Gerald; and Schneider, Rudolf, 4,550,514, Cl. 38-77.810.

Schneiderman, Gary: *See*—
Miles, Clive; and Schneiderman, Gary, 4,551,131, Cl. 604-31.000.

Schnell, Axel: *See*—
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,551,269, Cl. 252-520.000.

Schoenberg, Julian H., to W. R. Grace & Co., Cryovac Div. Oriented heat-sealable multilayer packaging film. 4,551,380, Cl. 428-218.000.

Scholz, Werner: *See*—
Radisch, Helmer; and Scholz, Werner, 4,551,484, Cl. 523-169.000.

Schonafinger, Karl; Beyerle, Rudi; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. 3-(4-Alkoxycarbonylpiperazin-1-yl)-sydnonimines, a process for their preparation and use. 4,551,454, Cl. 514-252.000.

Schonmeier, Herbert, to Jagenberg AG. Apparatus for the separate winding of slit webs. 4,550,887, Cl. 242-56.300.

Schossow, George W. Method of inhibiting snoring and obstructive sleep apnea. 4,551,473, Cl. 514-305.000.

Schreinemacher, Herbert: *See*—
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,551,269, Cl. 252-520.000.

Schreiner, Horst, to Siemens Aktiengesellschaft. Sintered compound material for electrical contacts and method for its production. 4,551,301, Cl. 419-21.000.

Schubert, Karl-Friedrich: *See*—
Deutscher, Hans-Christian; Kohler, Alfred; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,550,469, Cl. 15-250.340.

Schultschik, Robert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Radially adjustable tool head of a cutting machine. 4,551,044, Cl. 408-185.000.

Schultschik, Robert: *See*—
Grabher, Erich; Muller, Max; Wetzel, Horst; and Schultschik, Robert, 4,550,955, Cl. 308-6.00C.

Schulz, Hans-Werner, to Siemens Aktiengesellschaft. Ventilation inset for shielding cabins and room screening devices. 4,550,545, Cl. 52-799.000.

Schulze-Berge, Carl J., to Manitowoc Company, Inc., The. Ice machine anti-block control. 4,550,572, Cl. 62-138.000.

Schulze, Wolfgang, to Francotyp-Postalia GmbH. Device for lifting the flaps of letters or envelopes. 4,551,188, Cl. 156-441.500.

Schurter, Rolf: *See*—
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,551,531, Cl. 544-320.000.

Schwab, Daniel J.: *See*—
Gilbert, Barry K.; and Schwab, Daniel J., 4,551,746, Cl. 357-74.000.
Gilbert, Barry K.; and Schwab, Daniel J., 4,551,747, Cl. 357-74.000.

Schwab, Erwin; Parisi, Graziano; and Pander, Peter, to Battenfeld Extrusionstechnik GmbH. Method of and apparatus for maintaining a constant wall thickness for an extruded article. 4,551,289, Cl. 264-23.000.

Schwab, Walter. Pump for liquid and gaseous fluids, especially blood. 4,551,073, Cl. 417-352.000.

Schwabe, Kenneth R.: *See*—
El-Hag, Nabil A.; Cochran, Stuart A.; Schwabe, Kenneth R.; Carricato, Louis; and Shanbhag, Sudhakar P., 4,551,340, Cl. 426-437.000.

Schwaiger, Max: *See*—
Rieder, Heinz; and Schwaiger, Max, 4,550,505, Cl. 33-125.00C.

Schwartzenberger, Julius W., to Duo-Fast Corporation. Fastener driving tool. 4,550,643, Cl. 91-356.000.

Schwarzmann, Matthias: *See*—
Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,551,321, Cl. 423-329.000.

Schweikert, Glen E. Pallet-bar lift and support apparatus. 4,550,940, Cl. 294-67.400.

Schweizer, Rudolph C.: *See*—
Levinson, Frank H.; and Schweizer, Rudolph C., 4,550,975, Cl. 350-96.180.

Schwierking, Roger A.: *See*—
Reese, Vernon E.; and Schwierking, Roger A., 4,550,677, Cl. 118-31.000.

Sciarra, Michael: *See*—
Sciarra, Michael J., 4,551,149, Cl. 623-4.000.

Sciarra, Michael J., to Sciarra, Michael. Prosthetic vision system. 4,551,149, Cl. 623-4.000.

SCM Corporation: *See*—
Johnson, Walter E., Jr., 4,551,570, Cl. 585-355.000.

Scott, Peter T., to CertainTeed Corporation. Automated mineral wool roll-unit processing system. 4,550,550, Cl. 53-529.000.

Scottish & Newcastle Breweries plc: *See*—
Kesson, James, 4,550,590, Cl. 73-19.000.

Scoville, Robert E.: *See*—
Bell, John R.; Scoville, Robert E.; and Whitt, Joade, 4,550,867, Cl. 222-607.000.

Seal Company of New England, The: *See*—
Champlin, George B., 4,550,639, Cl. 87-7.000.

Sedrati, Madjid: *See*—
Frank-Neumann, Michel; Sedrati, Madjid; Vigneron, Jean-Pierre; and Bloy, Vincente, 4,551,545, Cl. 560-124.000.

Seeholzer, Joseph: *See*—
Behnke, Horst; Michaud, Horst; Seeholzer, Joseph; and Solansky, Svatoplug, 4,551,166, Cl. 71-30.000.

Seeley, Robert L., to United States of America, Interior. Magnetic susceptibility well-logging unit with single power supply thermoregulation system. 4,551,681, Cl. 324-333.000.

Seely, Earle S.; and LaValley, Roger O., to RFL Industries, Inc. Method and apparatus for degaussing magnetic storage media. 4,551,782, Cl. 361-151.000.

Segarra, Gerard, to U.S. Philips Corporation. Error-protected data transmission device and communication network. 4,551,842, Cl. 371-69.000.

Seib, Karl: *See*—
Straub, Ferdinand; Sanner, Axel; Seib, Karl; and Lang, Siegfried, 4,551,512, Cl. 526-264.000.

Seidel, Michael: *See*—
Tamm, Franz; Horicke, Bernhard; Welfle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, 4,551,183, Cl. 148-12.00R.

Seiki, Kazuo: *See*—
Tanaka, Akira; Tsunekawa, Takahiko; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,550,560, Cl. 57-261.000.

Seiler, Louis, Jr.; and Rosenbluth, Robert F., to Shiley Incorporated. Vascular graft prosthesis. 4,550,447, Cl. 623-1.000.

Sekida, Minoru: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,550,996, Cl. 354-416.000.

Sekiguchi, Koichi; Takematsu, Hikaru; Yamamoto, Kazuyuki; and Kubo, Teruyuki, to Telegraph & Telephone Pub. Corp.; and Iwasaki Tsushinki Kabushiki Kaisha. Control signal transmission system for key telephone system. 4,551,583, Cl. 179-99.00M.

Selvage, Craig C.; and Ventura, Frank D., to CPG Products Corp. Rotatable cam for use in a toy construction set. 4,551,110, Cl. 446-118.000.

Senyek, Michael L.: *See*—
Lal, Joginder; and Senyek, Michael L., 4,551,503, Cl. 525-332.100.

Seppelt, Wolfgang: *See*—
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,551,448, Cl. 514-130.000.

Serbent, Harry: *See—*
Formanek, Lothar; Hirsch, Martin; Serbent, Harry; Schnabel, Wolfram; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Rath, Gero, 4,551,172, Cl. 75-11.000.

Sestito, William F.: *See—*
Rich, Hubert A.; Saffer, Gary M.; and Sestito, William F., 4,551,127, Cl. 493-462.000.

Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Fluoroethoxyphenyl (di)thiophosphates, a process for their preparation and their use for controlling pests. 4,551,448, Cl. 514-130.000.

Sexton-Espec, Inc.: *See—*
Hohman, John E., 4,550,574, Cl. 62-197.000.

Shackelford, Carl L.; and Rainin, Kenneth, to Rainin Instrument Co. Inc. Modular liquid chromatography column apparatus. 4,551,249, Cl. 210-198.200.

Shadzi, Bahram: *See—*
Ericson, Charles P.; and Shadzi, Bahram, 4,551,355, Cl. 427-48.000.

Shaffer, Donald U. Ram construction for oil well blow out preventer apparatus. 4,550,895, Cl. 251-1.300.

Shalaby, Shalaby W.; and Schipper, Edgar S., to Ethicon, Inc. Flexible monofilament surgical sutures comprising poly(polymethylene terephthalate, isophthalate or cyclohexane-1,4-dicarboxylate-co-dimerate). 4,550,730, Cl. 128-335.500.

Shanbhag, Sudhakar P.: *See—*
El-Hag, Nabil A.; Cochran, Stuart A.; Schwabe, Kenneth R.; Carricato, Louis; and Shanbhag, Sudhakar P., 4,551,340, Cl. 426-437.000.

Sharon, Harold M., to United Technologies Corporation. Tool to produce a new angle on a fan blade. 4,550,497, Cl. 30-169.000.

Sharp Kabushiki Kaisha: *See—*
Koizumi, Satoru; Furuhara, Hiroshi; and Teshima, Daisuke, 4,551,775, Cl. 360-74.100.

Sheets, Robert L.: *See—*
Phillips, James D.; and Sheets, Robert L., 4,551,048, Cl. 409-197.000.

Shell Oil Company: *See—*
Blauwhoff, Petrus M. M.; and Cornelissen, Anton E., 4,551,233, Cl. 208-106.000.
Hudson, Henry C., 4,551,443, Cl. 502-313.000.
Kollmeyer, Willy D., 4,551,447, Cl. 514-94.000.

Shen, Jerome L., to Ralston Purina Company. Electrolytic treatment of vegetable protein. 4,551,274, Cl. 260-123.500.

Sherlock, Margaret H., to Schering Corporation. Composition containing 1-phenyl-1,8-naphthridin-2(1H)-ones and a non-steroidal anti-inflammatory drug. 4,551,463, Cl. 514-300.000.

Sherman, Benjamin F., Jr. Ball-like construction for a toy or the like. 4,551,111, Cl. 446-120.000.

Sherman, Guy J., to Sherman Laboratories, Inc. Soft contact lens ambient temperature disinfectant and rinsing solution and method. 4,551,461, Cl. 514-275.000.

Sherman Laboratories, Inc.: *See—*
Sherman, Guy J., 4,551,461, Cl. 514-275.000.

Sherwood, Donald G.: *See—*
Veronesi, Luciano; and Sherwood, Donald G., 4,550,941, Cl. 294-86.400.

Shibuya, Hiroko: *See—*
Sugiyama, Masami; Shibuya, Hiroko; and Kasahara, Yasushi, 4,551,272, Cl. 260-112.50R.

Shida, Takafumi: *See—*
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Shields, Edward P., to Westinghouse Electric Corp. Multiple fuel rod gripper. 4,551,299, Cl. 376-261.000.

Shiga, Akinobu; Kakugo, Masahiro; Kojima, Junpei; and Wakatsuki, Kizuku, to Sumitomo Chemical Company, Limited. Crystalline propylene polymer composition. 4,551,501, Cl. 525-88.000.

Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,551,009, Cl. 355-15.000.

Shiley Incorporated: *See—*
Seiler, Louis, Jr.; and Rosenbluth, Robert F., 4,550,447, Cl. 623-1.000.

Shimada, Satoshi: *See—*
Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, 4,550,612, Cl. 73-727.000.

Shimamura, Hayato; and Maeda, Osamitsu, to Misuzu Machineries & Engineering Ltd.; and Toner Tanker K.K. Ballast exhaust pipe closing appliance for a ship. 4,550,751, Cl. 138-93.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,551,121, Cl. 474-140.000.

Shimizu, Susumu: *See—*
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Shimoda, Michio; and Watanabe, Fumio, to Mitsubishi Denki Kabushiki Kaisha. Control system for strip configuration. 4,551,805, Cl. 364-469.000.

Shimotori, Kazuhiro; and Ozaki, Hideyuki, to Mitsubishi Denki Kabushiki Kaisha. Dram with polysi bit lines and added junction capacitance. 4,551,741, Cl. 357-23.600.

Shin-Etsu Chemical Co., Ltd.: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.

Shingu, Hiroshi, to Epson Corporation. Liquid crystal composition and display element including same. 4,550,980, Cl. 350-349.000.

Shinkawa, Hiroyasu: *See—*
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Shinko Electric Co., Ltd.: *See—*
Kubo, Takeshi; Kawano, Junji; Takahashi, Fumio; and Yamaguchi, Tsutomu, 4,551,729, Cl. 346-1.100.

Shinmura, Sadayuki: *See—*
Yoshida, Takumori; Yamada, Akira; and Shinmura, Sadayuki, 4,550,700, Cl. 123-432.000.

Shino, Akimitsu: *See—*
Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, 4,551,849, Cl. 381-86.000.

Shinohara, Shuichi, to Terumo Kabushiki Kaisha. Cannula device and medical bag having the same. 4,551,138, Cl. 604-262.000.

Shinohara, Shuichi, to Terumo Kabushiki Kaisha. Tube for medical instruments and medical bag device having the same. 4,551,140, Cl. 604-262.000.

Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, to Onahama Sakai Kagaku Kabushiki Kaisha. Method of producing surface-treated barium sulfate. 4,551,497, Cl. 524-423.000.

Shinya, Masuo: *See—*
Nishikawa, Eiichiro; Shinya, Masuo; Ueda, Kayako; and Kaneko, Katsumi, 4,551,556, Cl. 568-403.000.

Shionogi & Co., Ltd.: *See—*
Sugasawa, Tsutomu; Toyoda, Tatsuo; and Sasakura, Kazuyuki, 4,551,554, Cl. 568-322.000.

Shipley Company Inc.: *See—*
Gulla, Michael; Taylor, Paul; and Oddi, Michael J., 4,551,409, Cl. 430-192.000.

Shirato, Moritoshi: *See—*
Fujita, Kouichi; and Shirato, Moritoshi, 4,551,841, Cl. 371-66.000.

Showa Denko Kabushiki Kaisha: *See—*
Iizuka, Eiichi; Sando, Tomoji; Kashima, Shinji; and Maki, Masakazu, 4,551,195, Cl. 156-603.000.
Iizuka, Eiichi, 4,551,316, Cl. 423-290.000.

Shuert, Lyle. Palletized container. 4,550,830, Cl. 206-386.000.

Sides, Daniel H.: *See—*
Moores, Robert G., Jr.; Sides, Daniel H.; and Burnside, Howard L., 4,550,501, Cl. 30-393.000.

Siecor Corporation: *See—*
Cooper, Stephen M.; and Sooudi, Saeed K., 4,550,976, Cl. 350-96.230.

Siemens Aktiengesellschaft: *See—*
Aidn, Martin, 4,551,698, Cl. 335-78.000.
Argyo, Wilhelm, 4,551,216, Cl. 204-192.00C.
Falk, Gertrud, 4,551,609, Cl. 219-121.0PR.
Lischke, Burkhard; and Plies, Erich, 4,551,625, Cl. 250-310.000.
Merchant, Kamal; and Schmitt, Claude, 4,551,709, Cl. 340-347.0DA.
Schreiner, Horst, 4,551,301, Cl. 419-21.000.
Schulz, Hans-Werner, 4,550,545, Cl. 52-799.000.

Siemon Company, The: *See—*
Donais, Norman; and Nitowski, Ronald, 4,550,964, Cl. 339-44.00M.
Pohl, Karl-Heinz, 4,550,969, Cl. 339-98.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.P.A.: *See—*
Cavazza, Claudio; and Tinti, Maria O., 4,551,477, Cl. 514-547.000.

Silver, Paul J.: *See—*
Sulkowski, Theodore S.; Silver, Paul J.; Mascitti, Albert A.; and Bender, Reinhold H. W., 4,551,534, Cl. 546-123.000.

Simmons, Billy R.: *See—*
Simmons, Harold J.; and Simmons, Billy R., 4,550,519, Cl. 43-15.000.

Simmons, Harold J.; and Simmons, Billy R. Fishing rod holder with automatic hook setter. 4,550,519, Cl. 43-15.000.

Simmons, Lacy W. Poultry procesaing method and apparatus. 4,550,473, Cl. 17-11.000.

Simmons, Richard J., to Plastofilm Industries, Inc. Stackable shipping and display container. 4,550,837, Cl. 211-126.000.

Simmons, Robert N. X-Ray and photographic viewer. 4,550,515, Cl. 40-362.000.

Simon, Frederick A.; and Forcey, Thomas H., to Ford Motor Company. Retainer for radio receiver. 4,550,944, Cl. 296-70.000.

Simpson Industries, Inc.: *See—*
Ferguson, Robert J., 4,551,115, Cl. 464-83.000.

Simpson, Roger A., to Emhart Industries, Inc. Fire alarm pull station. 4,551,707, Cl. 340-287.000.

Singh, Gurdip, to Combustion Engineering, Inc. Liquid level control system for vapor generator. 4,551,796, Cl. 364-148.000.

Singh, Prithipal: *See—*
Pirio, Marcel R.; and Singh, Prithipal, 4,551,275, Cl. 260-239.00D.

Siniscalchi, Luciano. Process for the production of padding for clothing or furnishings and product. 4,551,383, Cl. 428-286.000.

Sisbarro, Frederick P., to Carter-Wallace Inc. Production of a solid stick in a container. 4,551,093, Cl. 432-59.000.

Sket, Boris: *See—*
Zupancic, Natasa; Sket, Boris; Zupet, Pavel; and Zupan, Marko, 4,551,525, Cl. 544-49.000.

SKF Kugellagerfabriken GmbH: *See—*
Walter, Lothar; and Reith, Walter, 4,550,479, Cl. 29-148.40C.
Skvara, Frantisek; Kolar, Karel; Zadak, Zdenek; Friml, Zdenek; and Novotry, Jaroslay. Rapidly binding high-strength cement binding agent and a method of its preparation. 4,551,176, Cl. 106-90.000.
SKW Trostberg Aktiengesellschaft: *See—*
Behnke, Horst; Michaud, Horst; Seeholzer, Joseph; and Solansky, Svatoplug, 4,551,166, Cl. 71-30.000.
Slavik, William H.; and Huber, William B., to Nuvatec, Inc. Intravenous set. 4,551,134, Cl. 604-67.000.
Sliger, David E., to Storage Technology Corporation. Write drive with current mirrors which reduce feed-through. 4,551,772, Cl. 360-46.000.
Sloan Valve Company: *See—*
Berg, Arthur A., 4,550,928, Cl. 280-421.000.
Slocum, Chester D.: *See—*
Batty, John R., Jr.; and Slocum, Chester D., 4,550,732, Cl. 128-419.0PG.
Slusarchyk, William A.; and Kronenthal, David, to E. R. Squibb & Sons, Inc. 2-Oxoazetidin-1-yloxymethyl sulfonic acid and analogs. 4,551,276, Cl. 260-239.00A.
Smallbrook, Henry C.; and Spicer, William E. Air brake slack adjustment and measurement tools. 4,550,460, Cl. 7-164.000.
Smead, Robert G.: *See—*
Demeny, Gary L.; and Smead, Robert G., 4,550,678, Cl. 118-630.000.
Smith, Arnold M. Ring joint gasket. 4,550,921, Cl. 277-167.500.
Smith, Barry L., to UMC Industries, Inc. Coin apparatus. 4,550,819, Cl. 194-1.00N.
Smith, Dwight D.; and Cranfill, Leonard J., to Stant Inc. Canister roll seam. 4,550,850, Cl. 220-253.000.
Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Floor cleaning composition. 4,551,481, Cl. 521-52.000.
Smith Kline & French Laboratories Limited: *See—*
Cooper, David G.; and Sach, George S., 4,551,466, Cl. 514-318.000.
Smith, Lawrence A., Jr., to Chemical Research & Licensing Company. Deetherification process. 4,551,567, Cl. 568-907.000.
Smith, Orbert S., to Whirlpool Corporation. Electrical hose swivel connector for canister vacuum cleaner. 4,550,958, Cl. 339-5.00R.
Smith, Peter W., to United Technologies Corporation. Monolithic polarizer grating. 4,551,692, Cl. 333-21.00A.
Smith, Richard R.; and Wilson, John R., to Goodyear Tire & Rubber Company, The. Polyester melt blends having high gas barrier properties. 4,551,368, Cl. 428-35.000.
Smith, Robert D.: *See—*
Crossley, Peter W.; and Smith, Robert D., 4,551,617, Cl. 219-464.000.
Smith, Stanley K.; and Rozsi, Donald J., to Eaton Corporation. Tool wear sensors. 4,551,808, Cl. 364-474.000.
Smith, Susan: *See—*
Aston, Geoffrey W.; Smith, Susan; Chapman, Paul; and Barker, Howard A., 4,551,384, Cl. 428-312.600.
Smith, Wallace R. Monuments for graves. 4,550,537, Cl. 52-103.000.
Smolnikov, Nikolai V.: *See—*
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.
Smucker, Willard. Implement for contact application of liquid herbicides to crops. 4,550,526, Cl. 47-1.500.
Smyth, Robert R., to Eaton Corporation. Automatic transmission control method. 4,551,802, Cl. 364-424.100.
Snetting, Mark; West, Dan; and Hacker, John R., to Wagner Spray Tech Corporation. Seal for a power fed roller. 4,550,919, Cl. 277-23.000.
Snow, Arthur W.: *See—*
Kovacena, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., 4,551,349, Cl. 427-255.600.
Snyder, Clair W., Jr.: *See—*
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,550,960, Cl. 339-14.00R.
Societe Anonyme Automobiles Citroen: *See—*
Vilain, Claude; and Noel, Gapp, 4,550,932, Cl. 280-689.000.
Societe Anonyme Automobiles Peugeot: *See—*
Vilain, Claude; and Noel, Gapp, 4,550,932, Cl. 280-689.000.
Societe Anonyme de Telecommunications: *See—*
ab der Halden, Charles H.; and Berenguier, Pierre H., 4,551,845, Cl. 375-40.000.
Ouhayoun, Michel; and Robert, Alain, 4,551,843, Cl. 372-87.000.
Societe Anonyme des Usines Chausson: *See—*
Quercy, Alexandre P. L., 4,551,060, Cl. 414-541.000.
Societe Anonyme H.K. France: *See—*
Kinas, Henry, 4,551,046, Cl. 409-82.000.
Societe Chimique des Charbonnages S.A.: *See—*
Takayuki, Okada; Hisao, Tanaka; Ken-Ichi, Sawara; and Tsutomu, Konaka, 4,551,509, Cl. 526-68.000.
Societe d'Etudes de Machines Thermiques (SEMT): *See—*
Coulin, Jean-Paul, 4,550,647, Cl. 92-157.000.
Societe d'Exploitation du Laboratoire Abadie: *See—*
Benquey, Jean; and Benquey, Louisa F., 4,551,790, Cl. 362-23.000.
Societe Industrielle de Transports Automobiles "SITA" : *See—*
Demenais, Claude, 4,551,055, Cl. 414-293.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See—*
Fraignier, Bernard; and Gery, Daniel E., 4,550,617, Cl. 73-862.040.
Societe Nationale Industrielle et Aerospatiale: *See—*
Jourdan, Jean-Marie; Betelle, Jean; and Bougon, Philippe M. M., 4,551,632, Cl. 307-9.000.
Sodini, Giancarlo: *See—*
Canella, Marco; Marghinotti, Daniele; Bernardi, Adriano; and Sodini, Giancarlo, 4,551,335, Cl. 426-44.000.
Sokol, David G., to Dickey-john Corporation. Modular vehicular monitoring system. 4,551,801, Cl. 364-424.000.
Sokola, Raymond L.: *See—*
Moutrie, Michael F.; Sokola, Raymond L.; and Choi, Charles, 4,551,696, Cl. 333-204.000.
Solansky, Svatoplug: *See—*
Behnke, Horst; Michaud, Horst; Seeholzer, Joseph; and Solansky, Svatoplug, 4,551,166, Cl. 71-30.000.
Solar Power Laboratories, Ltd.: *See—*
Moravnik, Zvi, 4,550,712, Cl. 126-439.000.
Solis, Charles R.: *See—*
Mittal, Faquir C.; and Solis, Charles R., 4,551,787, Cl. 361-387.000.
Sommer, Reinhold. Tennis racket frame. 4,550,909, Cl. 273-73.00G.
Sone, Yoshiaki: *See—*
Ohkubo, Yoshio; Sone, Yoshiaki; Hashimoto, Susumu; Ishikawa, Kiyotsugu; Omae, Masanori; and Hiramoto, Masao, 4,551,757, Cl. 358-212.000.
Sonoda, Michiaki: *See—*
Higashiguchi, Toshiaki; and Sonoda, Michiaki, 4,551,767, Cl. 358-257.000.
Sony Corporation: *See—*
Machida, Yukihiko; Nakano, Kenji; and Takahashi, Takao, 4,551,771, Cl. 360-19.100.
Narita, Takato, 4,551,749, Cl. 358-28.000.
Ogawa, Masumi; Kawakami, Hiromi; and Meguro, Toshiaki, 4,551,756, Cl. 358-197.000.
Sase, Masatoshi; and Yamanaka, Seisuke, 4,551,761, Cl. 358-213.000.
Wachi, Shigeaki, 4,551,661, Cl. 318-314.000.
Sooudi, Saeed K.: *See—*
Cooper, Stephen M.; and Sooudi, Saeed K., 4,550,976, Cl. 350-96.230.
Sotobayashi, Hideto: *See—*
Asmussen, Frithjof; Sotobayashi, Hideto; Chen, Jiang-Tsun; and Schnabel, Wolfram, 4,551,414, Cl. 430-270.000.
Southwire Company: *See—*
Sanders, Eugene T., 4,550,583, Cl. 72-247.000.
Spaeth, Hans, to Maag Gear-Wheel and Machine Company Limited. Double-flank composite error tester. 4,550,508, Cl. 33-179.50C.
Spangler, Glenn E.; and Cox, John N., to Allied Corporation. Ion mobility spectrometer system with improved specificity. 4,551,624, Cl. 250-287.000.
Spector, George: *See—*
Mariano, Kenneth E.; and Spector, George, 4,550,534, Cl. 52-19.000.
Spectra-Physics, Inc.: *See—*
Bernhardt, Anthony F., 4,551,684, Cl. 330-4.300.
Speegle, Robert W. Seam pulling tool for tearing out welded seams of containers. 4,550,634, Cl. 81-418.000.
Speidell, James L.: *See—*
Di Milia, Vincent; Maldonado, Juan R.; Speidell, James L.; and Warlaumont, John M., 4,551,192, Cl. 156-345.000.
Spencer-Watkins, Harry C.: *See—*
Stratford, Michael G.; and Spencer-Watkins, Harry C., 4,550,745, Cl. 137-99.500.
Sperry Corporation: *See—*
Clark, Thomas R.; and Griffith, Carl D., 4,551,804, Cl. 364-434.000.
Cohn, Martin; Jacoby, George V.; and Vinding, Jorgen P., 4,551,773, Cl. 360-40.000.
de Jong, Joannes N. M.; and Earle, Richard L., 4,551,699, Cl. 336-135.000.
Kritz, Jacob A., 4,551,826, Cl. 367-150.000.
Mittal, Faquir C.; and Solis, Charles R., 4,551,787, Cl. 361-387.000.
Roeder, Robert S.; and Sterghos, Peter M., 4,551,728, Cl. 343-761.000.
Spicer, William E.: *See—*
Smallbrook, Henry C.; and Spicer, William E., 4,550,460, Cl. 7-164.000.
Spiller, Robert S. Disposable or reusable animal trap. 4,550,523, Cl. 43-61.000.
Spisz, Albert S., to Burroughs Corporation. Coupled drive shaft. 4,551,118, Cl. 464-182.000.
Sprague, William H. Wall-contained electric water heating tank. 4,551,612, Cl. 219-312.000.
Spruck, George T. Device for determining time of sunrise and sunset. 4,551,027, Cl. 368-15.000.
SRI International: *See—*
Wood, Bernard J.; Brittain, Robert D.; and Sancier, Kenneth M., 4,551,155, Cl. 48-197.00R.
Stabeg Apparatebaugesellschaft m.b.H.: *See—*
Salansky, Werner, 4,551,791, Cl. 362-296.000.
Stabenow, Joachim: *See—*
Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,551,321, Cl. 423-329.000.
Stadler, Ewald: *See—*
Schettler, Helmut; and Stadler, Ewald, 4,551,789, Cl. 361-406.000.

Stahura, Daniel W.; and Richey, Daniel D., to General Motors Corporation. Electric starting system. 4,551,630, Cl. 290-38.00R.

Stammely, Thomas E.: *See*—
Annunziata, Eugene J.; and Stammely, Thomas E., 4,551,671, Cl. 324-51.000.

Stanadyne, Inc.: *See*—
Djordjevic, Ilija, 4,550,702, Cl. 123-450.000.

Standard Oil Company: *See*—
Li, George S., 4,551,156, Cl. 55-16.000.
Mark, Seymour, 4,551,179, Cl. 106-277.000.

Standard Oil Company (Indiana): *See*—
Miller, Jeffrey T.; and Hensley, Albert L., Jr., 4,551,572, Cl. 585-454.000.

Standard Oil Company (Ohio), The: *See*—
Pesa, Frederick A.; and Graham, Anne M., 4,551,442, Cl. 502-178.000.

Stant Inc.: *See*—
Smith, Dwight D.; and Cranfill, Leonard J., 4,550,850, Cl. 220-253.000.

Staron, James S.: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,550,960, Cl. 339-14.00R.

Stearman, William L., to UOP Inc. Corrosion prevention and cleaning of air-cooled heat exchangers. 4,551,181, Cl. 134-22.110.

Stearns, Stanley D. Variable tensioning system for shear seal valves. 4,550,742, Cl. 137-14.000.

Stefan, Alexander. Earth boring machine and working crane. 4,550,787, Cl. 175-88.000.

Stegman, Todd R.: *See*—
Herberg, Michael J.; Macander, Rudolph F.; and Stegman, Todd R., 4,551,515, Cl. 528-18.000.

Stein Industrie: *See*—
Fournier, Jean; Patron, Henri; and Meynard, Paul, 4,550,777, Cl. 165-162.000.

Steinhaus, Harald: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; Fritz, Wolfgang; Steinhaus, Harald; and Bley, Peter, 4,551,157, Cl. 55-17.000.

Sterghos, Peter M.: *See*—
Roeder, Robert S.; and Sterghos, Peter M., 4,551,728, Cl. 343-761.000.

Sterling Drug Inc.: *See*—
Gorman, William G.; and Byron, David A., 4,551,135, Cl. 604-82.000.
Harrison, Thomas S., 4,550,855, Cl. 221-63.000.

Stevecleave Limited: *See*—
Whitlam, Joseph E.; and Richards, Alwyn H., 4,550,541, Cl. 52-309.800.

Stewart-Warner Corporation: *See*—
Hamilton, Lawrence E.; and Rutili, Renzo N., 4,551,598, Cl. 200-314.000.

Stewart, William J.: *See*—
Reid, Douglas C. J.; and Stewart, William J., 4,551,020, Cl. 356-73.100.

Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Resele, Peter, 4,550,927, Cl. 280-281.00R.

Stiefel Laboratories, Inc.: *See*—
Stiefel, Werner K.; and Nicolai, Daniel W., 4,551,480, Cl. 514-680.000.

Stiefel, Werner K.; and Nicolai, Daniel W., to Stiefel Laboratories, Inc. Compositions for the treatment of psoriasis. 4,551,480, Cl. 514-680.000.

Stiff, Rodney A., to Toft Bros. Industries Ltd. Sugar cane harvesting method and apparatus. 4,550,552, Cl. 56-13.900.

Stillman, Theodore. Vitamin E compositions and methods. 4,551,332, Cl. 424-195.100.

Stoepel, Kurt: *See*—
Wehinger, Egbert; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,551,467, Cl. 514-334.000.

Stojek, Dieter, to Ford Motor Company. Carburetor with a slidable throttle member controlling the air induction passage. 4,551,284, Cl. 261-44.00B.

Stone & Webster Engineering Corp.: *See*—
Bhojwani, Arju H.; and Woebcke, Herman N., 4,550,769, Cl. 165-1.000.

Storace, Anthony; and Ketchman, Jeffery, to AMF Inc. Method and apparatus for the simulation of the build up of the tread on a tire carcass. 4,551,806, Cl. 364-473.000.

Storage Technology Corporation: *See*—
Permut, Ronald; Cope, Robert; Apple, James; Epina, August P.; and Munro, Frederick G., 4,550,884, Cl. 242-189.000.
Sliger, David E., 4,551,772, Cl. 360-46.000.

Stough, Donald M., to Westinghouse Electric Corp. Combustion control system. 4,551,088, Cl. 431-76.000.

Stoutamore, James F.: *See*—
Woodworth, Raymond D.; Stoutamore, James F.; and Vanderhoek, Philip S., 4,550,747, Cl. 137-487.500.

Strack, Hans; Roebke, Wolfgang; Kneitel, Dieter; and Parr, Ehrfried, to Degussa Aktiengesellschaft; and Henkel Kommandelgesellschaft auf Aktien. Process for preparing zeolite powder of type A (IV). 4,551,322, Cl. 423-329.000.

Strahs, Martin P., to Quickie Manufacturing Corporation. Spring clip for push broom. 4,550,829, Cl. 206-361.000.

Stratford, Michael G.; and Spencer-Watkins, Harry C., to Burroughs Wellcome Co. Device for discharging a mixture of two liquids. 4,550,745, Cl. 137-99.500.

Straub, Ferdinand; Sanner, Axel; Seib, Karl; and Lang, Siegfried, to BASF Aktiengesellschaft. Water-soluble polymers having a low hygroscopicity. 4,551,512, Cl. 526-264.000.

Stryker, Howard Y.: *See*—
Callahan, David J.; Mazzawy, Robert S.; Stryker, Howard Y.; and Kelly, James B., 4,550,564, Cl. 60-39.093.

Stuaffer Chemical Company: *See*—
Alesandrini, Carlo G., Jr.; and Nady, Louie A., 4,551,325, Cl. 423-488.000.

Stubblefield, Jerry D., to Pensa, Inc. Basketball shoe sole. 4,550,510, Cl. 36-32.00R.

Stuhler, Herbert, to Hoechst Aktiengesellschaft. Process for the preparation of polyglycerols. 4,551,561, Cl. 568-619.000.

Stupak, Rimma I.: *See*—
Axenov, Ivan I.; Bren, Viktor G.; Padalka, Valentin G.; Sablev, Leonid P.; Stupak, Rimma I.; and Khoroshikh, Vladimir M., 4,551,221, Cl. 204-298.000.

Sturtevant, Inc.: *See*—
Saverse, Ronald R.; and Jones, Harold T., 4,551,241, Cl. 209-148.000.

Sucato, Edward. Baffle for canteens to prevent liquid splashing sounds. 4,550,848, Cl. 220-22.000.

Suezawa, Mitsuru: *See*—
Kitamura, Kazuo; and Suezawa, Mitsuru, 4,551,516, Cl. 528-18.000.

Sugasawa, Tsutomu; Toyoda, Tatsuo; and Sasakura, Kazuyuki, to Shionogi & Co., Ltd. Process for production of 2-haloacetylphenols. 4,551,554, Cl. 568-322.000.

Sugaya, Masami; Sawada, Daisaku; and Okawa, Susumu, to Toyota Jidosha Kabushiki Kaisha. Hydraulic apparatus for a continuously variable transmission. 4,551,119, Cl. 474-28.000.

Sugihara, Hironobu, to Kabushiki Kaisha AG. Radio controlled yacht and sail for the latter. 4,551,113, Cl. 446-154.000.

Sugimoto, Hiroshi; and Fukada, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Abnormal noise detector for inspecting gear units. 4,550,604, Cl. 73-587.000.

Sugimoto, Hiroshi: *See*—
Fukada, Koichi; and Sugimoto, Hiroshi, 4,550,603, Cl. 73-587.000.

Sugimoto, Naohiko; and Kojima, Tetsuro, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,551,420, Cl. 430-505.000.

Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Method of developing silver halide photographic material. 4,551,419, Cl. 430-445.000.

Sugimoto, Tadao; Ikeda, Hideo; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,551,421, Cl. 430-509.000.

Sugiyama, Masami; Shibuya, Hiroko; and Kasahara, Yasushi, to Fujirebio Kabushiki Kaisha. Derivatives of dipeptide and their use in determining the activity of carboxypeptidase A. 4,551,272, Cl. 260-112.50R.

Suisman, A. Eileen: *See*—
Burke, William L., Sr.; Marple, Elwood; and Suisman, A. Eileen, 4,550,602, Cl. 73-428.000.

Sulkowski, Theodore S.; Silver, Paul J.; Mascitti, Albert A.; and Bender, Reinhold H. W., to American Home Products Corporation. Aralkyl or aryloxyalkyl 1,7-naphthyridine-3-carboxylic acid esters. 4,551,534, Cl. 546-123.000.

Sullivan, Dale W.; Janssen, Kermit W.; and Mitchell, Andrew, to CertainTeed Corporation. Well screen. 4,550,778, Cl. 166-234.000.

Sulzer Brothers Ltd.: *See*—
Holik, Herbert; and Kurtz, Rudiger, 4,551,204, Cl. 162-336.000.

Sumitomo Chemical Company, Limited: *See*—
Otake, Katsumasa; Ikeda, Takashi; Omura, Takashi; and Imada, Kunihiko, 4,551,150, Cl. 8-496.000.
Sato, Hiroshi; and Nakamura, Shuzo, 4,551,568, Cl. 568-939.000.
Shiga, Akinobu; Kakugo, Masahiro; Kojima, Junpei; and Wakatsuki, Kizuku, 4,551,501, Cl. 525-88.000.

Sumiyoshi, Kikuo; Sato, Eiji; Hirai, Kazuo; Miyasaka, Kingo; and Izumi, Masayoshi, to Oiles Industry Co., Ltd. Heat-resistant shift member. 4,551,393, Cl. 428-609.000.

Sun Refining and Marketing Company: *See*—
Hsu, Chao-Yang; and Ellis, Paul E., Jr., 4,551,559, Cl. 568-454.000.

Sundstrand Corporation: *See*—
Beck, Richard, Jr., 4,550,645, Cl. 91-499.000.

Sundstrand Data Control, Inc.: *See*—
Paterson, Noel S., 4,551,723, Cl. 340-946.000.

Sung, Rodney L., to Texaco Inc. Alcohol fuel anti-wear additive. 4,551,152, Cl. 44-78.000.

Superior Plastic Products Corp.: *See*—
Whitford, Alan, 4,550,831, Cl. 206-439.000.

Surgidyne Inc.: *See*—
McNeil, Charles B., 4,551,141, Cl. 604-317.000.

Surjaatmadja, Jim B.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; and Penn, Jack C., 4,551,766, Cl. 358-256.000.

Sutryn, Caroll S.; and Maietta, Michael G., to West Company, The. Multicompartment medicament container. 4,550,825, Cl. 206-222.000.

Suzuki, Atsushi; Ninomiya, Masakazu; Maeda, Katsuya; and Kawashima, Yutaka, to Nippondenso Co., Ltd. Air-fuel ratio control in an internal combustion engine. 4,550,701, Cl. 123-436.000.

Suzuki, Eiichi, to Canon Kabushiki Kaisha. Ink-jet recording method. 4,551,736, Cl. 346-140.00R.

Suzuki, Hidetsugu: *See*—
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.

Suzuki, Hirokazu: *See*—
Takeda, Hirofumi; and Suzuki, Hirokazu, 4,551,639, Cl. 307-455.000.
Suzuki, Hisao: *See*—
Horie, Motonobu; Hirabayashi, Toshiyasu; and Suzuki, Hisao, 4,550,821, Cl. 198-416.000.
Suzuki, Kensuke, to Hitachi, Ltd. High switching speed semiconductor device containing graded killer impurity. 4,551,744, Cl. 357-64.000.
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, to Victor Company of Japan; and Mitsubishi Mining & Cement Co., Ltd. Loudspeaker diaphragm made of a molded, sintered ceramic body. 4,550,797, Cl. 181-167.000.
Suzuki, Masami: *See*—
Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, 4,550,480, Cl. 29-156.40R.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Motor controlling switch device. 4,551,660, Cl. 318-293.000.
Suzuki, Masayoshi; and Saigo, Kazuhide, to NEC Corporation. Method of forming patterns in manufacturing microelectronic devices. 4,551,417, Cl. 430-316.000.
Suzuki, Shingo: *See*—
Inoue, Masao; and Suzuki, Shingo, 4,550,977, Cl. 350-128.000.
Suzuki, Tetsuo; and Tazaki, Shigemitsu, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 4,551,735, Cl. 346-140.00R.
Suzuki, Yasutoshi: *See*—
Itoh, Hiroyasu; Suzuki, Yasutoshi; Horiuchi, Yasuhiro; and Hara, Kunihiko, 4,551,669, Cl. 323-268.000.
Svoboda Entwicklung AG, Firma: *See*—
Svoboda, Rudolf, 4,550,666, Cl. 108-96.000.
Svoboda, Rudolf, to Svoboda Entwicklung AG, Firma. Equipment stand. 4,550,666, Cl. 108-96.000.
Swartz, Henry D.; and Miller, Alan H., to Anechoic Systems Company, Inc. Acoustic panel and enclosure. 4,550,798, Cl. 181-201.000.
Swift, Steven G.: *See*—
McFarlane, Glenton P.; and Swift, Steven G., 4,550,743, Cl. 137-68.100.
Swinehart, Steven L.; and Kuhn, Werner H., to Nisus Video Incorporated. Diagonal sweep shutter mechanism for video tape camera. 4,551,763, Cl. 358-225.000.
SWS Silicones Corporation: *See*—
Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., 4,551,350, Cl. 427-389.900.
Symborski, Alex P.: *See*—
Frailey, Richard C.; and Symborski, Alex P., 4,551,160, Cl. 65-2.000.
Syntex (U.S.A.) Inc.: *See*—
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,551,459, Cl. 514-267.000.
Pirio, Marcel R.; and Singh, Prithipal, 4,551,275, Cl. 260-239.00D.
Syrop, Alan N.: *See*—
Temple, Stephen; Jones, Nigel J.; and Syrop, Alan N., 4,550,472, Cl. 17-1.00R.
Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, 4,551,462, Cl. 514-283.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Kiss, Bela; Ezer, Elemer; and Hajos, Gyorgy, to Richter Gedeon Vegyeszeti Gyar Rt. Eburnane derivatives, process for their preparation and pharmaceutical compositions containing them. 4,551,462, Cl. 514-283.000.
Szeberenyi, Szabolcs: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.
Szmadzinski, John A.: *See*—
Wiersema, Delbert; and Szmadzinski, John A., 4,550,893, Cl. 248-222.400.
Szporny, Laszlo: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.
Szuminski, Gary F., to Rolls-Royce Inc. Streamlined nozzle for turbomachines. 4,550,877, Cl. 239-265.350.
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, to Eisai Co., Ltd. Analgesic peptide and process for the preparation thereof. 4,551,273, Cl. 260-112.50E.
Tachihara, Satoru, to Asahi Optical Co., Ltd. Small size telephoto lens. 4,550,987, Cl. 350-454.000.
Tachikawa Spring Co., Ltd.: *See*—
Ohnishi, Yutaka, 4,550,872, Cl. 228-48.000.
Sakamoto, Takao, 4,550,949, Cl. 297-284.000.
Tadokoro, Eiichi: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, 4,551,386, Cl. 428-323.000.
Tagaya, Ryosaku, to Eisai Co., Ltd. Testing method by a spectroscopic photometry using three wavelengths of light and a device for said method. 4,551,022, Cl. 356-406.000.
Takahashi, Akira: *See*—
Nishi, Kohichi; and Takahashi, Akira, 4,550,997, Cl. 354-459.000.
Takahashi, Fumio: *See*—
Kubo, Takeshi; Kawano, Junji; Takahashi, Fumio; and Yamaguchi, Tsutomu, 4,551,729, Cl. 346-1.100.
Takahashi, Hideyuki: *See*—
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, 4,551,404, Cl. 430-59.000.
Takahashi, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, to Fujitsu Limited. Multiplexing input circuit. 4,551,634, Cl. 307-243.000.
Takahashi, Kiyoshi; Konagai, Makoto; Yoshitomi, Toshihiko; and Omori, Takeshi, to Mitsubishi Chemical Industries Limited. Substrate for amorphous silicon semiconductor material. 4,551,575, Cl. 136-255.000.
Takahashi, Mineo: *See*—
Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, 4,550,480, Cl. 29-156.40R.
Takahashi, Takao: *See*—
Machida, Yukihiko; Nakano, Kenji; and Takahashi, Takao, 4,551,771, Cl. 360-19.100.
Takahashi, Yoshiteru; and Ogawa, Masataka, to Fuji Photo Film Co., Ltd. Disc type brushless motor. 4,551,645, Cl. 310-46.000.
Takahata, Satoru: *See*—
Kobayashi, Waichi; and Takahata, Satoru, 4,551,211, Cl. 204-37.600.
Takasaki, Shuichi, to Matsushita Electric Works, Ltd. Construction of a connection for flat cables. 4,551,579, Cl. 174-88.00R.
Takasawa, Yoshio: *See*—
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, 4,551,478, Cl. 514-603.000.
Takasu, Yoshio: *See*—
Hiro, Masaaki; Takasu, Yoshio; Ishikawa, Shozo; Katagiri, Kazuharu; and Takahashi, Hideyuki, 4,551,404, Cl. 430-59.000.
Takayuki, Okada; Hisao, Tanaka; Ken-Ichi, Sawara; and Tsutomu, Konaka, to Societe Chimique des Charbonnages S.A. Process for manufacturing homopolymers and copolymers of ethylene. 4,551,509, Cl. 526-68.000.
Takeda Chemical Industries, Ltd.: *See*—
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, 4,551,532, Cl. 546-22.000.
Takeda, Hirofumi; and Suzuki, Hirokazu, to Fujitsu Limited. Emitter coupled logic circuit controlled by a set input signal. 4,551,639, Cl. 307-455.000.
Takeda, Koji; Akahane, Masao; Mukaiyama, Fumiaki; and Kudo, Yasuhiko, to Kabushiki Kaisha Suwa Seikosha. FSK Demodulation circuit. 4,551,846, Cl. 375-82.000.
Takekoshi, Yashitaka: *See*—
Amemiya, Yoichi; Ishida, Hiroshi; Takekoshi, Yashitaka; and Ushiyama, Shigeyuki, 4,551,676, Cl. 324-208.000.
Takemae, Yoshihiro; and Kabashima, Katsuhiko, to Fujitsu Limited. Dynamic semiconductor memory device. 4,551,822, Cl. 365-222.000.
Takematsu, Hikaru: *See*—
Sekiguchi, Koichi; Takematsu, Hikaru; Yamamoto, Kazuyuki; and Kubo, Teruyuki, 4,551,583, Cl. 179-99.00M.
Takematsu, Tetsuo; Konnai, Makoto; Morinaka, Hideo; Nonaka, Yunji; and Nakanishi, Akira, to Toyo Soda Manufacturing Company, Limited. Metamethoxy aryl carbamate derivatives and herbicides. 4,551,169, Cl. 71-94.000.
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, to Hitachi, Ltd. Solid-state imaging device. 4,551,742, Cl. 357-31.000.
Takeuchi, Shuhei: *See*—
Koike, Hiroshi; Takeuchi, Shuhei; and Miyajima, Mikio, 4,551,033, Cl. 400-308.000.
Takeuchi, Yukihisa, to NGK Insulators, Ltd. Process of manufacturing ceramic circuit board. 4,551,357, Cl. 427-96.000.
Takumi, Nobusuke: *See*—
Honma, Ichiro; Koyama, Arata; Amano, Masatoshi; and Takumi, Nobusuke, 4,551,327, Cl. 423-594.000.
Talish, Roger J.; and Banko, Victor F., to Electro-Biology, Inc. Electromagnetic coil insert for an orthopedic cast or the like. 4,550,714, Cl. 128-1.500.
Talley, John J., to General Electric Company. Method for making polymethylated phenols. 4,551,563, Cl. 568-804.000.
Tamm, Franz; Horicke, Bernhard; Weifle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, to VEB Stahl-und Walzwerk "Wilhelm Florin". Method for improving the straightness of rolled steel. 4,551,183, Cl. 148-12.00R.
Tamura, Hifumi: *See*—
Noda, Tamotsu; Tamura, Hifumi; and Okano, Hiroshi, 4,551,650, Cl. 313-362.100.
Tamura, Masao: *See*—
Takemoto, Iwao; Ohba, Shiya; Aoki, Masakazu; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Tamura, Masao; and Miyao, Masanobu, 4,551,742, Cl. 357-31.000.
Tamura, Tadashi; Nakao, Etsuro; and Yamazaki, Hiroaki, to Carl Freudenberg, Firma. Electrode separator for an electric cell. 4,551,402, Cl. 429-254.000.
Tamura, Takahiro: *See*—
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, 4,551,082, Cl. 418-55.000.
Tanaka, Akio; and Kamo, Yasuo, to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Vertical type pulverizing and classifying apparatus. 4,550,879, Cl. 241-52.000.

Tanaka, Akira; Tsunekawa, Takahiko; Seiki, Kazuo; and Nakamura, Haruyoshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for piecing fasciated yarn. 4,550,560, Cl. 57-261.000.

Tanaka, Itsuo: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,550,578, Cl. 68-5.00E.

Tanaka, Shuji: *See*—
Aoki, Matsuyuki; and Tanaka, Shuji, 4,551,002, Cl. 355-3.0DD.

Tanaka, Teruaki: *See*—
Ehiro, Takashi; Tanaka, Teruaki; and Yamanaka, Eisuke, 4,550,582, Cl. 72-234.000.

Tanaka, Teruo: *See*—
Hoshino, Kazuo; Tanaka, Teruo; and Ito, Kenjiro, 4,550,487, Cl. 29-527.700.

Tanaka, Yasuhiro: *See*—
Asaka, Urataro; Kanai, Shigeo; Tanaka, Yasuhiro; and Iwamoto, Kazuya, 4,551,074, Cl. 417-366.000.

Tanaka, Yasushi: *See*—
Ogawa, Hisashi; Tanaka, Yasushi; and Sato, Yoshimitsu, 4,550,923, Cl. 280-5.00A.

Tanaka, Yoshimasa: *See*—
Kikuchi, Yasuyuki; Matsumoto, Eiichi; and Tanaka, Yoshimasa, 4,550,695, Cl. 123-41.120.

Tanaka, Yutaka: *See*—
Nishizawa, Taiji; and Tanaka, Yutaka, 4,551,753, Cl. 358-140.000.

Tang, Yui K.: *See*—
Chan, Lo K.; Tang, Yui K.; and Chang, Jui, 4,550,871, Cl. 228-4.500.

Taniguchi, Mitsuyuki: *See*—
Ishida, Hiroshi; and Taniguchi, Mitsuyuki, 4,551,662, Cl. 318-316.000.

Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, to Minolta Camera Kabushiki Kaisha. Device for providing a camera system with an information for a focus adjustment. 4,550,993, Cl. 354-402.000.

Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Flash photography system. 4,550,996, Cl. 354-416.000.

Taniguti, Ryosuke, to Mitsubishi Denki Kabushiki Kaisha. Ground detection arrangement for an A.C. generator. 4,551,811, Cl. 364-481.000.

Tanikawa, Minoru; Imaizumi, Yutaka; Suzuki, Masami; Aiba, Kazumi; Sato, Minoru; and Takahashi, Mineo, to Hitachi, Ltd. Method of producing scroll type compressor. 4,550,480, Cl. 29-156.40R.

Tanji, Shigeo; and Wakatsuki, Noboru, to Fujitsu Limited. Surface acoustic device having multistrip coupler comprised of alternate coupled and uncoupled strips. 4,551,695, Cl. 333-195.000.

Tank, Eggert: *See*—
Wiegard, Klaus; Kinast, Karlheinz; Kleinekathofer, Wolfgang; and Tank, Eggert, 4,551,396, Cl. 428-678.000.

Tapeswitch Corporation of America: *See*—
Koenig, Robert H.; and Lovell, Walter, 4,551,595, Cl. 200-86.00R.

Taprogge Gesellschaft mbH: *See*—
Schmitz, Gunther, 4,550,466, Cl. 15-104.06R.

Tarabout, Alain: *See*—
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, 4,551,852, Cl. 455-33.000.

Tarozzi, R. A.; and Formhals, C., to King-Seeley Thermos Co. Leakproof dispensing container. 4,550,864, Cl. 222-209.000.

Tate, Ralph, Jr.; and Woods, John T., to Whirlpool Corporation. Center rail assembly for refrigerator. 4,550,576, Cl. 62-441.000.

Tateosian, Louis H.; and Wilson, W. Donald, to Dentsply Research & Development Corp. Interpenetrating polymer network compositions. 4,551,486, Cl. 523-212.000.

Taylor, Paul: *See*—
Gulla, Michael; Taylor, Paul; and Oddi, Michael J., 4,551,409, Cl. 430-192.000.

Taylor, Paul D.; and Mocella, Michael T., to Atlantic Richfield Company. Decomposition of hydroperoxides in the presence of homogeneous binary catalysts. 4,551,553, Cl. 568-311.000.

Tazaki, Shigemitsu: *See*—
Suzuki, Tetsuo; and Tazaki, Shigemitsu, 4,551,735, Cl. 346-140.00R.

Teague, James R.: *See*—
Dragoo, Robert E.; Teague, James R.; Burberry, Lee M.; Bailey, David C.; Bardos, Andrew M.; and Grossman, Barry G., 4,551,829, Cl. 370-3.000.

Tecumseh Products Company: *See*—
Campen, Kenneth W., 4,550,697, Cl. 123-149.00D.

Teerman, Richard F.; Bosch, Russell H.; and Wirth, Ricky C., to General Motors Corporation. Electromagnetic unit fuel injector with piston assist solenoid actuated control valve. 4,550,875, Cl. 239-88.000.

Tektronix, Inc.: *See*—
Andrews, Roland E.; and Addis, John L., 4,551,636, Cl. 307-264.000.
Causley, Gary C.; and Rosback, Martin D., 4,551,734, Cl. 346-140.00R.
Metz, Arthur J., 4,551,656, Cl. 315-392.000.
Rogers, Jerrold J., 4,551,732, Cl. 346-110.00R.

Telediffusion de France: *See*—
Botrel, Jose ; Harari, Sami; Briere, Joseph; and Louvel, Bernard, 4,551,839, Cl. 371-35.000.

Telefonaktiebolaget LM Ericsson: *See*—
Ingre, Lars P., 4,550,483, Cl. 29-416.000.
Wall, Lars E.; and Jonsson, John E., 4,551,752, Cl. 358-113.000.

Telegraph & Telephone Pub. Corp.: *See*—
Sekiguchi, Koichi; Takematsu, Hikaru; Yamamoto, Kazuyuki; and Kubo, Teruyuki, 4,551,583, Cl. 179-99.00M.

Telle, Helmut: *See*—
Brinkwerth, Wolfgang; Huffer, Wolfgang; Raue, Roderich; Schieder, Rudolf; and Telle, Helmut, 4,551,265, Cl. 252-301.170.

Temple, Stephen; Jones, Nigel J.; and Syrop, Alan N., to Devro, Inc. Apparatus for and method of shirring a tubular casing. 4,550,472, Cl. 17-1.00R.

Tenzer, Abraham I., to Bio-Organics, Inc. Microbial plant growth promoter. 4,551,164, Cl. 71-6.000.

Tepley, Judy M.: *See*—
Johnson, Carter F.; Larson, Cheryl L.; and Tepley, Judy M., 4,550,758, Cl. 160-271.000.

Terumo Kabushiki Kaisha: *See*—
Shinohara, Shuichi, 4,551,138, Cl. 604-262.000.
Shinohara, Shuichi, 4,551,140, Cl. 604-262.000.

Teshima, Daisuke: *See*—
Koizumi, Satoru; Furuhara, Hiroshi; and Teshima, Daisuke, 4,551,775, Cl. 360-74.100.

Teshima, Hitoshi, to Toyota Jidosha Kabushiki Kaisha. Exhaust support system. 4,550,795, Cl. 180-296.000.

Testa, Raymond T.: *See*—
Lee, Taikwang M.; Borders, Donald B.; Goodman, Joseph J.; Testa, Raymond T.; Maiese, William M.; and Labeda, David P., 4,551,533, Cl. 546-35.000.

Tetragenics, Inc.: *See*—
Cookson, John A.; Schatzka, Richard L.; Echard, Richard A.; and Scheer, Gary W., 4,551,718, Cl. 340-825.160.

Tettke, Wolfgang: *See*—
Tamm, Franz; Horicke, Bernhard; Welfle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, 4,551,183, Cl. 148-12.00R.

Texaco Inc.: *See*—
Kuhlmann, Erven J., 4,551,224, Cl. 208-10.000.
Sung, Rodney L., 4,551,152, Cl. 44-78.000.

Textron Inc.: *See*—
DeCaro, Charles J., 4,550,476, Cl. 29-26.00A.

Thaden, Theron J.: *See*—
Watts, George T.; and Thaden, Theron J., 4,550,827, Cl. 206-304.000.

Tharp, Charles P.: *See*—
Riley, Thomas C., Jr.; Tharp, Charles P.; and Lapka, Galen G., 4,551,148, Cl. 604-890.000.

Theissen, Robert J., to Rhone-Poulenc, Inc. 2-Nitro-5-(substituted-phenoxy) phenylalkanone oxime and imine derivatives as herbicides. 4,551,171, Cl. 71-121.000.

Therma-Tru Corp.: *See*—
Thorn, John E., 4,550,540, Cl. 52-309.400.

Thielscher-Electronic GmbH: *See*—
Benzinger, Hans, 4,551,686, Cl. 330-100.000.

Thoeny, Theodore T. Method for forming structures. 4,550,544, Cl. 52-741.000.

Thoma, Martin, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Method for recognizing structural inhomogeneities in titanium alloy test samples including welded samples. 4,551,434, Cl. 436-5.000.

Thomas & Betts Corporation: *See*—
Izraeli, Hyman, 4,550,965, Cl. 339-47.00R.

Thomas, Erwin: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,551,318, Cl. 423-265.000.

Thomas, Geoffrey N.: *See*—
Cross, Peter E.; Dickinson, Roger P.; and Thomas, Geoffrey N., 4,551,468, Cl. 514-339.000.

Thomaschewski, Hubertus P.: *See*—
Harms, Engelbert G.; Schmeitz, Axel W.; and Thomaschewski, Hubertus P., 4,551,362, Cl. 427-180.000.

Thomey, Henry W., to Dyneer Corporation. Belt tensioner. 4,551,120, Cl. 474-135.000.

Thompson, John A. Process for preparing alkali metal ferrates. 4,551,326, Cl. 423-594.000.

Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., to Consolidated Foods Corporation. Material handling system. 4,550,670, Cl. 112-121.110.

Thompson, Randall D.: *See*—
Carlin, John A.; Mesch, William G.; Mobeck, William L.; Thompson, Randall D.; Henthorn, Jules B.; and Lopez, Benjamin L., 4,551,719, Cl. 340-825.360.

Thomson-CSF: *See*—
Bossaert, Jean, 4,551,679, Cl. 324-309.000.
Cornet, Jean; Lange , Francois; Le Carvennec, Francois; Lehureau, Jean-Claude; and Rascle, Roger, 4,551,733, Cl. 346-137.000.
Deman, Pierre; and Potage, Jean, 4,551,853, Cl. 455-72.000.
Depey, Maurice, 4,550,491, Cl. 29-577.00C.
Guidevaux, Jacques, 4,551,693, Cl. 333-22.00R.
Reymond, Jean C., 4,550,984, Cl. 350-404.000.

Thomson, Ian M., to Cable Belt Limited. Cables and process for forming cables. 4,550,559, Cl. 57-223.000.

Thoratec Laboratories Corporation: *See*—
Miles, Clive; and Schneiderman, Gary, 4,551,131, Cl. 604-31.000.

Thorn Emi Domestic Appliances Limited: *See*—
Buttery, Michael H. C., 4,551,616, Cl. 219-460.000.
Crossley, Peter W.; and Smith, Robert D., 4,551,617, Cl. 219-464.000.

Thorn, John E., to Therma-Tru Corp. Compression molded door assembly. 4,550,540, Cl. 52-309.400.

Thornley, W. Ray: *See*—
Lundahl, E. Cordell; Wiser, James G.; Thornley, W. Ray; and Jensen, Laurel H., 4,550,554, Cl. 56-294.000.

Tihanyi, Bela: *See*—
Erben, Edwin; Muhlratzer, August; Bertinger, Roland; Cornils, Boy; Tihanyi, Bela; and DeWin, Werner, 4,551,328, Cl. 423-607.000.

Tilley, Jefferson W., to Hoffmann-La Roche Inc. Pyrido[2,1-b]quinazoline derivatives useful as agents for treatment of allergic conditions and vascular disorders involving thrombosis. 4,551,460, Cl. 514-267.000.

Tillman, James J.: *See*—
Burzynski, Alfred J.; and Tillman, James J., 4,551,361, Cl. 427-164.000.

Timmermans, Franciscus W. A.; and Van Roessel, Frederik J., to U.S. Philips Corporation. Television line deflection circuit. 4,551,655, Cl. 315-370.000.

Tinti, Maria O.: *See*—
Cavazza, Claudio; and Tinti, Maria O., 4,551,477, Cl. 514-547.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; and Ueno, Hiroshi, 4,551,440, Cl. 502-119.000.
Nishikawa, Eiichiro; Shinya, Masuo; Ueda, Kayako; and Kaneko, Katsumi, 4,551,556, Cl. 568-403.000.

Toft Bros. Industries Ltd.: *See*—
Stiff, Rodney A., 4,550,552, Cl. 56-13.900.

Tohkai, Masaie: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.

Tokuda, Ryuji: *See*—
Ohtsuka, Masanori; and Tokuda, Ryuji, 4,550,992, Cl. 354-173.110.

Tokunaga, Yoshikuni: *See*—
Akisue, Osamu; Yamada, Teruaki; Ueda, Shigeru; Tokunaga, Yoshikuni; and Yamada, Masato, 4,551,182, Cl. 148-12.00C.

Tokyo Denpa Kabushiki Kaisha: *See*—
Ishigami, Sumiyuki; and Sato, Mitsuru, 4,550,475, Cl. 29-25.350.

Tokyo Electric Co., Ltd.: *See*—
Kubota, Hiromi; and Kambe, Toshiyuki, 4,551,588, Cl. 200-33.00R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Matsuo, Kenji; and Abou, Shouji, 4,551,683, Cl. 328-167.000.
Murakami, Kenji, 4,551,743, Cl. 357-50.000.
Murase, Koji, 4,550,509, Cl. 34-133.000.
Nakatomi, Yoshisugu; Uchida, Kohachi; and Hashimoto, Shinichi, 4,551,014, Cl. 355-75.000.
Ogawa, Atsushi, 4,551,691, Cl. 331-111.000.
Ozono, Jiro, 4,550,565, Cl. 60-39.182.
Saito, Tomotaka; and Nagao, Kenichi, 4,551,716, Cl. 340-711.000.
Sanbayashi, Takeshi; and Matsumoto, Hiroshi, 4,551,813, Cl. 364-569.000.

Tomita, Shuichi, to Pioneer Electronic Corporation. Mount for loudspeaker on vehicle panel. 4,550,796, Cl. 181-141.000.

Tomiyama, Hideki; and Satake, Masaki, to Fuji Photo Film Co., Ltd. Photographic element for color diffusion transfer with two neutralizing layers. 4,551,410, Cl. 430-215.000.

Tomizu, Motoyuki: *See*—
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, 4,551,592, Cl. 200-67.00D.

Toner Tanker K.K.: *See*—
Shimamura, Hayato; and Maeda, Osamitsu, 4,550,751, Cl. 138-93.000.

Tooson, Ronald: *See*—
Maher, Robert J.; and Tooson, Ronald, 4,551,016, Cl. 355-91.000.

Topfl, Werner: *See*—
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,551,531, Cl. 544-320.000.

Toray Industries, Inc.: *See*—
Kitamura, Kazuo; and Suezawa, Mitsuru, 4,551,516, Cl. 528-18.000.

Toriuchi, Masaharu: *See*—
Koyama, Koichi; Noguchi, Yasuhiro; and Toriuchi, Masaharu, 4,551,423, Cl. 430-559.000.

Torley, Jozsef: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, 4,551,465, Cl. 514-317.000.

Toroid Transformator AB: *See*—
Waldemar, Anders, 4,551,700, Cl. 336-192.000.

Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szabolcs; Szporny, Laszlo; Gorog, Sandor; and Hajdu, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Piperidine derivatives and pharmaceutical compositions containing them. 4,551,465, Cl. 514-317.000.

Toyama, Masamichi, to Canon Kabushiki Kaisha. Automatic focus adjusting device. 4,550,995, Cl. 354-403.000.

Toyo Aerosol Industry Co., Ltd.: *See*—
Hirao, Katsumi; and Sasaki, Akira, 4,550,865, Cl. 222-402.210.

Toyo Boseki Kabushiki Kaisha: *See*—
Sakamoto, Junichi; Fujimoto, Hiroshi; and Miyake, Hideo, 4,551,215, Cl. 204-159.230.

Toyo Seikan Kaisha, Ltd.: *See*—
Maruhashi, Yoshitsugu; and Hirata, Sadao, 4,551,366, Cl. 428-35.000.

Toyo Soda Manufacturing Company, Limited: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Morinaka, Hideo; Nonaka, Yunji; and Nakanishi, Akira, 4,551,169, Cl. 71-94.000.

Toyoda Gosei Kabushiki Kaisha: *See*—
Manabe, Katsuhide; and Tsutsui, Masatoshi, 4,551,387, Cl. 428-336.000.

Toyoda, Tatsuo: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; and Sasakura, Kazuyuki, 4,551,554, Cl. 568-322.000.

Toyosu, Yasuhiro: *See*—
Akamatsu, Norio; and Toyosu, Yasuhiro, 4,550,735, Cl. 128-639.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hamada, Makoto; Hasegawa, Junji; and Oosaka, Kuniaki, 4,550,948, Cl. 296-202.000.
Ogawa, Hisashi; Tanaka, Yasushi; and Sato, Yoshimitsu, 4,550,923, Cl. 280-5.00A.
Okumura, Takeshi; Warashina, Tomio; and Nakanishi, Kiyoshi, 4,550,699, Cl. 123-308.000.
Sugaya, Masami; Sawada, Daisaku; and Okawa, Susumu, 4,551,119, Cl. 474-28.000.
Teshima, Hitoshi, 4,550,795, Cl. 180-296.000.
Ueda, Masahiro, 4,550,596, Cl. 73-117.300.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ootuka, Takayuki; and Murai, Toshiyuki, 4,550,703, Cl. 123-478.000.

Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; Tsuboi, Yoshimasa; and Kondo, Akinobu, 4,550,709, Cl. 126-96.000.

Trage, Burghard; Hintzen, Franz-Josef; and Leitz, Richard, to Balcke-Durr Aktiengesellschaft. Forced-air cooled condenser system. 4,550,570, Cl. 60-693.000.

Trager, Louis: *See*—
Rao, Srinivas T.; and Trager, Louis, 4,551,212, Cl. 204-52.00R.

Traiteur, Rene : *See*—
Zuber, Thierry; and Traiteur, Rene , 4,550,688, Cl. 122-360.000.

Traumuller, Otfried; and Weinberg, Gerd, to Furnier -u. Sperrholzwerk; and J. F. Werz Jr. KG Werzalit-Pressholzwerk. Stackable box with adjustable cover. 4,550,832, Cl. 206-509.000.

Traumuller, Otfried; and Weinberg, Gerd, to Furnier- u. Sperrholzwerk; and J. F. Werz Jr. KG Werzalit-Pressholzwerk. Stackable box. 4,550,847, Cl. 220-4.00F.

Traxler, Peter, to Ciba-Geigy Corporation. Rifamycin hydrazones, pharmaceutical compositions containing them and their use. 4,551,450, Cl. 514-183.000.

Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 4-(3-Acylamino-2-oxo-1-azetidinyl)-4-oxo-2-butenoic acid. 4,551,277, Cl. 260-239.00A.

Trick, Robert E., to Medical Engineering Corporation. Capacitance device for medical implant. 4,550,720, Cl. 128-79.000.

Trick, Robert E.: *See*—
Finney, Roy P.; Trick, Robert E.; and Lynch, Henry W., 4,550,719, Cl. 128-79.000.

Tridgell, Eric J.: *See*—
Hall, Timothy J.; and Tridgell, Eric J., 4,550,527, Cl. 47-58.000.

Trigilio, Gaetano T. Wind and solar electric generating plant. 4,551,631, Cl. 290-55.000.

Trispel, Stephan; and Rau, Gunter, to Forschungsgesellschaft fur Biomedizinische Technik e.V. Arrangement for the carrying out of eye examination. 4,550,990, Cl. 351-243.000.

Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik: *See*—
Fischer, Dieter, 4,551,622, Cl. 250-211.00R.

Trochoid Power Corporation: *See*—
Hoffmann, Ralph M., 4,551,083, Cl. 418-61.00A.

Trolle, Sten. Device for sorting and compressing packagings, principally beverage cans, in several stages. 4,550,658, Cl. 100-215.000.

Troup, Alan P.; Guttinger, Hannes; and Pfister, Gustav, to Cerberus AG. Method and apparatus for reporting dangerous conditions. 4,551,710, Cl. 340-505.000.

Troxell, Lillian H.: *See*—
Johnston, Howard; and Troxell, Lillian H., 4,551,170, Cl. 71-94.000.

Trubiano, Paolo C.; and Kasica, James J., to National Starch and Chemical Corporation. Compressible starches as binders for tablets or capsules. 4,551,177, Cl. 106-210.000.

TRW Inc.: *See*—
Drutchas, Gilbert H.; and Borza, John S., 4,550,597, Cl. 73-118.000.
Horton, Robert A.; and Jayaraman, Gowri S., 4,550,764, Cl. 164-122.200.

Tschang, Chung-Ji; and Marcinowski, Stefan, to BASF Aktiengesellschaft. Macroporous, hydrophilic enzyme carrier. 4,551,482, Cl. 521-53.000.

Tsuboi, Yoshimasa: *See*—
Nakamura, Kazuharu; Tsuboi, Yoshimasa; and Kondo, Akinobu, 4,550,709, Cl. 126-96.000.

Tsuchie, Takanori: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,551,565, Cl. 568-864.000.

Tsuchiya, Chikara: *See*—
Nishimori, Eiji; Tsuchiya, Chikara; and Sano, Yoshiaki, 4,551,644, Cl. 307-573.000.

Tsuchiya, Hiroyoshi; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Otsuka, Hirotaka, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for processing image signal. 4,551,768, Cl. 358-283.000.

Tsuda, Hiroshi: *See*—
Miyashita, Kiyoshi; Ozeki, Fumitaka; and Tsuda, Hiroshi, 4,551,010, Cl. 355-25.000.

Tsuda, Tadashi; Hiramatsu, Seiichiro; Ohtsuka, Mitsugi; and Maeno, Tsuyoshi, to Nippondenso Co., Ltd. Apparatus and method for detecting obstacles in the path of a moving vehicle. 4,551,722, Cl. 340-904.000.
Tsuda, Yoshihisa; and Jackson, Denise M., to UOP Inc. *Paracoccus denitrificans*, FUM-14: a fumarase overproducer. 4,551,432, Cl. 435-232.000.
Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Tsuji, Kanji, 4,550,753, Cl. 139-435.000.
Tsuji, Kanji, to Tsudakoma Kogyo Kabushiki Kaisha. Weft transfer control system in an air jet loom. 4,550,753, Cl. 139-435.000.
Tsunakawa, Hirokazu: *See*—
Fushimi, Kazuo; Tsunakawa, Hirokazu; and Yonahara, Kunio, 4,551,267, Cl. 252-511.000.
Tsunekawa, Takahiko: *See*—
Tanaka, Akira; Tsunekawa, Takahiko; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,550,560, Cl. 57-261.000.
Tsutomu, Konaka: *See*—
Takayuki, Okada; Hisao, Tanaka; Ken-Ichi, Sawara; and Tsutomu, Konaka, 4,551,509, Cl. 526-68.000.
Tsutsui, Eiji: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.
Tsutsui, Masatoshi: *See*—
Manabe, Katsuhide; and Tsutsui, Masatoshi, 4,551,387, Cl. 428-336.000.
Tufte, Obert N.: *See*—
Betsch, Regis J.; Liu, Michael S.; and Tufte, Obert N., 4,551,394, Cl. 428-641.000.
Tufts, Wesley M., to Control Fluidics, Inc. Toilet system. 4,550,452, Cl. 4-319.000.
Tunc, Deger C., to Johnson & Johnson Products Inc. Absorbable bone fixation device. 4,550,449, Cl. 623-16.000.
Tungsten Industries, Inc.: *See*—
Fletcher, George R., Jr.; Messick, George H., Jr.; Roby, Charles K.; and Huey, Cecil O., Jr., 4,550,532, Cl. 51-288.000.
Turner, Jonathan S., to AT&T Bell Laboratories. Distributed monitoring of packet transmission delay. 4,551,833, Cl. 370-60.000.
Turnpaugh, George F.: *See*—
Anders, James V.; Anderson, Thomas W.; Geiger, Daniel D.; and Turnpaugh, George F., 4,551,670, Cl. 323-281.000.
Uatar DTD.: *See*—
Rogers, Phillip P., 4,551,146, Cl. 604-403.000.
UBE Industries, Ltd.: *See*—
Kobayashi, Waichi; and Takahata, Satoru, 4,551,211, Cl. 204-37.600.
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,551,565, Cl. 568-864.000.
Ubukata, Susumu; and Mizutani, Yasukazu, to Ubukata, Susumu. Thermally actuated switching device. 4,551,701, Cl. 337-97.000.
Uchida, Kohachi: *See*—
Nakatomi, Yoshisugu; Uchida, Kohachi; and Hashimoto, Shinichi, 4,551,014, Cl. 355-75.000.
Uchikawa, Naoshi: *See*—
Hazaki, Eiichi; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Murayama, Akira; and Mizuno, Takao, 4,551,082, Cl. 418-55.000.
Uda, Taizo: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,551,565, Cl. 568-864.000.
Ueda, Kayako: *See*—
Nishikawa, Eiichiro; Shinya, Masuo; Ueda, Kayako; and Kaneko, Katsumi, 4,551,556, Cl. 568-403.000.
Ueda, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Apparatus for indicating an optimum shift position for a manual transmission installed in a vehicle. 4,550,596, Cl. 73-117.300.
Ueda, Shigeru: *See*—
Akisue, Osamu; Yamada, Teruaki; Ueda, Shigeru; Tokunaga, Yoshikuni; and Yamada, Masato, 4,551,182, Cl. 148-12.00C.
Ueki, Yoshiharu: *See*—
Sakaguchi, Shouzaburou; and Ueki, Yoshiharu, 4,551,774, Cl. 360-72.100.
Uematsu, Hiroaki; and Aoki, Junji, to Horiba, Ltd. Flow through system liquid membrane type electrode. 4,551,222, Cl. 204-417.000.
Uemura, Yukio: *See*—
Fujita, Masahiro; and Uemura, Yukio, 4,550,633, Cl. 81-56.000.
Ueno, Hiroshi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; and Ueno, Hiroshi, 4,551,440, Cl. 502-119.000.
Ueno, Susumu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nomura, Hirokazu; Tohkai, Masaie; Hata, Yoshitada; and Kato, Kenichi, 4,551,310, Cl. 422-186.050.
Ulmer, Harry E.: *See*—
Mathew, Chempolil T.; and Ulmer, Harry E., 4,551,323, Cl. 423-387.000.
Mathew, Chempolil T.; and Ulmer, Harry E., 4,551,324, Cl. 423-387.000.
Ultradent, Inc.: *See*—
Fischer, Dan E., 4,551,100, Cl. 433-218.000.
UMC Industries, Inc.: *See*—
Smith, Barry L., 4,550,819, Cl. 194-1.00N.
Umemoto, Mitsumasa: *See*—
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, 4,551,478, Cl. 514-603.000.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner, 4,551,116, Cl. 464-97.000.
Union Carbide Corporation: *See*—
Agrawal, Balkishan, 4,551,175, Cl. 75-513.000.
Barnabeo, Austin E., 4,551,504, Cl. 525-333.900.
Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, 4,550,471, Cl. 17-1.00R.
D'Silva, Themistocles D. J., 4,551,472, Cl. 514-477.000.
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith M., 4,551,236, Cl. 208-112.000.
Nausedas, Joseph A., 4,551,370, Cl. 428-36.000.
Robson, John H.; and Keller, George E., II, 4,551,566, Cl. 568-867.000.
Wheeler, Thomas N., 4,551,547, Cl. 560-255.000.
Union, Elias J., to J. C. & D Enterprises, Inc. Paper support bar with rotation resistant support fingers. 4,550,904, Cl. 271-198.000.
Union Oil Company of California: *See*—
Deering, Roland F.; and Duir, John H., 4,551,206, Cl. 202-99.000.
Fenton, Donald M., 4,551,237, Cl. 208-251.00R.
Young, Donald C.; and Green, James A., II, 4,551,167, Cl. 71-64.100.
Uniroyal Englebert Reifen GmbH: *See*—
Harms, Engelbert G.; Schmeitz, Axel W.; and Thomaschewski, Hubertus P., 4,551,362, Cl. 427-180.000.
United Kingdom Atomic Energy Authority: *See*—
Lane, Edward S.; and Hill, Michael R. H., 4,551,358, Cl. 427-126.600.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Elliott, Charles T.; and White, Anthony M., 4,551,623, Cl. 250-211.00R.
U.S. Clinical Products, Inc.: *See*—
Cummings, Robert, 4,550,842, Cl. 215-232.000.
United States of America
Agriculture: *See*—
Heiland, Wolfgang K., 4,550,905, Cl. 271-202.000.
Army: *See*—
Sayler, William M., 4,551,092, Cl. 432-32.000.
Health and Human Services: *See*—
Kolobow, Theodor; and Ito, Yoichiro, 4,551,251, Cl. 210-635.000.
Interior: *See*—
Seeley, Robert L., 4,551,681, Cl. 324-333.000.
National Aeronautics and Space Administration: *See*—
Bankston, Benjamin F., 4,551,677, Cl. 324-226.000.
Coffinberry, George A., 4,550,561, Cl. 60-39.020.
Goldstein, Richard M.; Caro, Edward R.; and Wu, Chialin, 4,551,724, Cl. 343-5.0CM.
Lukens, Fred E., 4,551,687, Cl. 330-258.000.
Navy: *See*—
Crabtree, Daniel L., 4,551,759, Cl. 358-213.000.
Evans, Alan G., 4,550,601, Cl. 73-382.00R.
Kovacena, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., 4,551,349, Cl. 427-255.600.
Petoia, Salvatore R., 4,551,059, Cl. 414-459.000.
U.S. Philips Corporation: *See*—
Capper, Peter; and Gosney, John J., 4,551,196, Cl. 156-616.00R.
Compen, Johannes M. A. A.; and Maan, Cornelis, 4,551,652, Cl. 313-466.000.
Da Silva, Artur F., 4,550,652, Cl. 99-279.000.
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, 4,551,852, Cl. 455-33.000.
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,551,269, Cl. 252-520.000.
Lienard, Jean-Claude, 4,551,834, Cl. 370-94.000.
Mellema, Sybe J., 4,551,793, Cl. 362-370.000.
Moors, Johannes H., 4,550,963, Cl. 339-31.00R.
Segarra, Gerard, 4,551,842, Cl. 371-69.000.
Timmermans, Franciscus W. A.; and Van Roessel, Frederik J., 4,551,655, Cl. 315-370.000.
van der Ven, Robert F. L. M., 4,551,651, Cl. 313-402.000.
United Technologies Corporation: *See*—
Callahan, David J.; Mazzawy, Robert S.; Stryker, Howard Y.; and Kelly, James B., 4,550,564, Cl. 60-39.093.
Carll, Richard T.; Fastaia, Anthony J.; and von Nieda, Kurt, 4,551,832, Cl. 370-58.000.
Mard, Kenneth C., 4,550,812, Cl. 188-379.000.
Rannenberg, George C., 4,550,573, Cl. 62-172.000.
Sharon, Harold M., 4,550,497, Cl. 30-169.000.
Smith, Peter W., 4,551,692, Cl. 333-21.00A.
Unitrode Corporation: *See*—
Hower, Philip L.; and Li, Eric K., 4,551,353, Cl. 427-39.000.
University of Alabama, The Board of Trustees of the: *See*—
Park, Duk-Won, 4,550,788, Cl. 175-173.000.
University of California, The Regents of the: *See*—
Ladisch, Stephan, 4,551,449, Cl. 514-182.000.
University of Pennsylvania, Trustees of the: *See*—
Zemel, Jay N., 4,551,425, Cl. 435-4.000.
University of Utah: *See*—
Michl, Josef; and Puebla-Ponce, Claudio G., 4,551,819, Cl. 365-120.000.

UOP Inc.: *See*—
Carson, Don B., 4,551,235, Cl. 208-100.000.
Hafner, Edmund W., 4,551,430, Cl. 435-94.000.
Imai, Tamotsu; and Hung, Chi-wen, 4,551,574, Cl. 585-660.000.
Roberts, John T., 4,551,536, Cl. 546-264.000.
Stearman, William L., 4,551,181, Cl. 134-22.110.
Tsuda, Yoshihisa; and Jackson, Denise M., 4,551,432, Cl. 435-232.000.

Urasaki, Takanori, to Agency of Industrial Science and Technology. Polyglycidyl ethers, process for production thereof, and cured products thereof. 4,551,508, Cl. 525-507.000.

Urata, Yukihide: *See*—
Ogawa, Masashi; Nakamura, Taku; Urata, Yukihide; and Yamauchi, Shingo, 4,551,412, Cl. 430-265.000.

USDATA Corporation: *See*—
Vaughn, Mitchell D., 4,551,831, Cl. 370-58.000.

Ushiyama, Shigeyuki: *See*—
Amemiya, Yoichi; Ishida, Hiroshi; Takekoshi, Yashitaka; and Ushiyama, Shigeyuki, 4,551,676, Cl. 324-208.000.

USM Corporation: *See*—
Schaty, Harald, 4,550,891, Cl. 248-68.100.

Utsumi, Masahiro: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, 4,551,386, Cl. 428-323.000.

Valencia, Vance I.: *See*—
Arendt, Paul N.; and Valencia, Vance I., 4,551,844, Cl. 373-12.000.

Valentine, Michael J.: *See*—
Reinfeld, Nyles V.; and Valentine, Michael J., 4,550,549, Cl. 53-447.000.

Valenzano, Marcello. Construction forms. 4,550,543, Cl. 52-309.700.

Vallourec S.A.: *See*—
Duret, Jean, 4,550,937, Cl. 285-334.000.

Valmet Oy: *See*—
Eskelinen, Pekka, 4,551,203, Cl. 162-202.000.
Laapotti, Jorma, 4,551,205, Cl. 162-360.100.

Van Buren, Charles E.: *See*—
Johnson, Curtis A.; Renlund, Gary M.; Van Buren, Charles E.; and Prochazka, Svante, 4,551,436, Cl. 501-90.000.

Van Coney, Robert H.: *See*—
Barker, Dale E.; Bettle, Griscom, III; and Van Coney, Robert H., 4,550,862, Cl. 222-109.000.

Vanderhoek, Philip S.: *See*—
Woodworth, Raymond D.; Stoutamore, James F.; and Vanderhoek, Philip S., 4,550,747, Cl. 137-487.500.

Vanderkooi, Nicholas, Jr.: *See*—
Haylock, John C.; and Vanderkooi, Nicholas, Jr., 4,551,507, Cl. 525-437.000.

Vandermeulen, Meine: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and Rogers, Charles J., 4,551,218, Cl. 204-240.000.

van der Ven, Robert F. L. M., to U.S. Philips Corporation. Color display tube including a shadow mask sheet with a bulged portion. 4,551,651, Cl. 313-402.000.

Van Deursen, Aad. Clothes drying device. 4,550,840, Cl. 211-197.000.

Van Dijk, Cornelis; and De Jongh, Rudolph O., to Internationale Octrooi Maatscappij "Octropa" B.V. Nickel boride-polymer in-oil catalyst. 4,551,441, Cl. 502-159.000.

Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., to Lummus Industries, Inc. Baling chamber assembly. 4,550,657, Cl. 100-43.000.

van Gelderen, Guido: *See*—
Breedyk, Frans N.; and van Gelderen, Guido, 4,550,598, Cl. 73-146.000.

van Leusen, Adriaan M.: *See*—
van Leusen, Albert M.; and van Leusen, Adriaan M., 4,551,278, Cl. 260-397.400.

van Leusen, Albert M.; and van Leusen, Adriaan M., to Gist-Brocades N.V. Preparation of 20-keto-Δ^{16}-steroids. 4,551,278, Cl. 260-397.400.

Van Roessel, Frederik J.: *See*—
Timmermans, Franciscus W. A.; and Van Roessel, Frederik J., 4,551,655, Cl. 315-370.000.

Varadarajan, Hemmige D., to Advanced Micro Devices, Inc. ECL Gate with switched load current source. 4,551,638, Cl. 307-455.000.

Varwig, Juergen: *See*—
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,551,448, Cl. 514-130.000.

Vater, Wulf: *See*—
Wehinger, Egbert; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,551,467, Cl. 514-334.000.

Vaughn, Mitchell D., to USDATA Corporation. Time division multiplexed system for non real time digital switching. 4,551,831, Cl. 370-58.000.

VEB Stahl-und Walzwerk "Wilhelm Florin": *See*—
Tamm, Franz; Horicke, Bernhard; Welfle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, 4,551,183, Cl. 148-12.00R.

Vella, Paul J.; Garel-Jones, Philip M.; and Lowe, Richard S., to Northern Telecom Limited. Measuring chromatic dispersion of fibers. 4,551,019, Cl. 356-73.100.

Venema, Harry J., to Borg-Warner Corporation. Torque measurement circuit and method. 4,550,595, Cl. 73-116.000.

Venkatesan, Srinivasan: *See*—
Sapru, Krishna; Hong, Kuochih; Fetcenko, Michael A.; and Venkatesan, Srinivasan, 4,551,400, Cl. 429-94.000.

Ventura, Frank D.: *See*—
Selvage, Craig C.; and Ventura, Frank D., 4,551,110, Cl. 446-118.000.

Venuti, Michael C.: *See*—
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,551,459, Cl. 514-267.000.

Verne, Stefan, to BICC Public Limited Company. Telecommunication cable filling composition. 4,551,569, Cl. 585-6.600.

Vernier, Claude: *See*—
Blanie, Paul; and Vernier, Claude, 4,551,341, Cl. 426-489.000.

Veronesi, Luciano; and Sherwood, Donald G., to Westinghouse Electric Corp. Hydraulic drive mechanism. 4,550,941, Cl. 294-86.400.

Verstraete, Rick A.: *See*—
Moore, Donald W.; and Verstraete, Rick A., 4,551,814, Cl. 364-716.000.
Moore, Donald W.; and Verstraete, Rick A., 4,551,815, Cl. 364-716.000.

Vervacke, Steven L.: *See*—
Miller, Robert E.; and Vervacke, Steven L., 4,551,739, Cl. 346-216.000.

Vetco Offshore, Inc.: *See*—
Haeber, John A.; Rains, John K.; Beitler, Brad D.; and Kukuchek, George S., 4,550,936, Cl. 285-26.000.

Victor, Alan M.; and Davis, Darrell E., to Motorola, Inc. Synthesized multiple conversion receiver system with provision for avoiding receiver self-quieting spurious response. 4,551,856, Cl. 455-183.000.

Victor Company of Japan: *See*—
Suzuki, Kiyoaki; Suzuki, Hidetsugu; Onuki, Katsuhiro; Nomoto, Isami; Fukuda, Yoshiaki; and Sato, Takeshi, 4,550,797, Cl. 181-167.000.

Victor Company of Japan, Limited: *See*—
Fujii, Yasuhiko; Owaki, Isao; Saito, Susumu; Mori, Takaro; and Nakamura, Shinji, 4,551,840, Cl. 371-38.000.

Vigneron, Jean-Pierre: *See*—
Frank-Neumann, Michel; Sedrati, Madjid; Vigneron, Jean-Pierre; and Bloy, Vincente, 4,551,545, Cl. 560-124.000.

Vilain, Claude; and Noel, Gapp, to Societe Anonyme Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Device for transversely maintaining an anti-roll bar. 4,550,932, Cl. 280-689.000.

Villiger, Alois: *See*—
Petrzilka, Martin; Schadt, Martin; and Villiger, Alois, 4,550,981, Cl. 350-350.00R.

Vincent, Jan G.: *See*—
Engstrom, Nils M. L., 4,550,594, Cl. 73-61.10C.

Vinding, Jorgen P.: *See*—
Cohn, Martin; Jacoby, George V.; and Vinding, Jorgen P., 4,551,773, Cl. 360-40.000.

Vissers, Hermanus H.; and Wondergem, Jan, to Multinorm B.V. Device to form crop into round bales. 4,550,557, Cl. 56-341.000.

Vitale, Vincent J., to Green, Mickey. Farm products agricultural game. 4,551,103, Cl. 434-225.000.

Voest-Alpine Aktiengesellschaft: *See*—
Hofbauer, Edwin; Lechner, Peter; and Exler, Heribert, 4,551,051, Cl. 414-21.000.

Volk, Joseph A.: *See*—
Volk, Joseph A., Jr.; and Volk, Joseph A., 4,550,619, Cl. 73-862.620.

Volk, Joseph A., Jr.; and Volk, Joseph A., to Beta II, Incorporated. Suspension for a linear force transducer. 4,550,619, Cl. 73-862.620.

Volkamer, Klaus: *See*—
Wagner, Eckhart; Volkamer, Klaus; Hefner, Werner; and Wagner, Ulrich, 4,551,158, Cl. 55-46.000.

Volterra, Giovanna: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giolitti, Alessandro; Volterra, Giovanna; Furio, Martino; and Meli, Alberto, 4,551,451, Cl. 514-217.000.

von Halasz, Sigmar: *See*—
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,551,513, Cl. 526-307.100.

von Nieda, Kurt: *See*—
Carll, Richard T.; Fastaia, Anthony J.; and von Nieda, Kurt, 4,551,832, Cl. 370-58.000.

Vredenburg, Edric W., Sr. Vacuum bag filler. 4,550,755, Cl. 141-59.000.

W.C. Heraeus GmbH: *See*—
Opower, Hans, 4,551,608, Cl. 219-121.00L.

W. R. Grace & Co., Cryovac Div.: *See*—
Owensby, Joseph E.; Rupp, Jody W.; Dobbins, Frederick A.; and Waldrop, Thomas E., 4,550,548, Cl. 53-434.000.
Pezzana, Francesco; and Quacquarella, Cesare, 4,551,125, Cl. 493-217.000.
Schoenberg, Julian H., 4,551,380, Cl. 428-218.000.

Wachi, Shigeaki, to Sony Corporation. Driving apparatus for a recording medium. 4,551,661, Cl. 318-314.000.

Wada, Sumio; and Inakagata, Satoru, to Matsushita Electric Works, Ltd. Quick charging apparatus. 4,551,666, Cl. 320-20.000.

Wagman, Julius; and Sajic, Branko, to Helene Curtis Industries, Inc. Skin and hair conditioner compositions and conditioning method. 4,551,330, Cl. 424-59.000.

Wagner, Bill L., Sr., to Bio Clinic Company. Method and apparatus for rolling and packaging convoluted foam pads. 4,550,547, Cl. 53-430.000.

Wagner, Eckhart; Volkamer, Klaus; Hefner, Werner; and Wagner, Ulrich, to BASF Aktiengesellschaft. Removal of CO_2 and/or H_2S from gases. 4,551,158, Cl. 55-46.000.

Wagner, Rudolph; and Schiwiora, Harry, to Degussa Aktiengesellschaft. Dental alloy based on palladium for the production of fixed and removable dental constructions. 4,551,302, Cl. 420-464.000.

Wagner Spray Tech Corporation: *See*—
Karliner, Rudolf R.; and Carlin, Samuel R., 4,551,036, Cl. 401-131.000.
Snetting, Mark; West, Dan; and Hacker, John R., 4,550,919, Cl. 277-23.000.

Wagner, Ulrich: *See*—
Wagner, Eckhart; Volkamer, Klaus; Hefner, Werner; and Wagner, Ulrich, 4,551,158, Cl. 55-46.000.

Wakabayashi, Manabu: *See*—
Saito, Tadashi; Higuchi, Shigemitsu; Konno, Kazutoshi; Sampei, Tohru; Hayashi, Kenji; Noro, Yoshihiko; and Wakabayashi, Manabu, 4,551,777, Cl. 360-77.000.

Wakatsuki, Kizuku: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Kojima, Junpei; and Wakatsuki, Kizuku, 4,551,501, Cl. 525-88.000.

Wakatsuki, Noboru: *See*—
Tanji, Shigeo; and Wakatsuki, Noboru, 4,551,695, Cl. 333-195.000.

Wakefield, G. Felix; Bender, David L.; and Rea, Samuel N., to Atlantic Richfield Company. Surface improvement of semiconductors in high speed casting. 4,551,291, Cl. 264-104.000.

Wakikaido, Takahiro: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,551,013, Cl. 355-55.000.

Waldemar, Anders, to Toroid Transformator AB. Toroidal power transformer. 4,551,700, Cl. 336-192.000.

Waldes Kohinoor, Inc.: *See*—
Killian, Edmund F., 4,550,485, Cl. 29-450.000.

Waldner Laboreinrichtungen GmbH & Co.: *See*—
Denner, Wolf J.; Biernacki, Andreas; and Breitschwerdt, Gunter, 4,550,650, Cl. 98-115.300.

Waldrop, Thomas E.: *See*—
Owensby, Joseph E.; Rupp, Jody W.; Dobbins, Frederick A.; and Waldrop, Thomas E., 4,550,548, Cl. 53-434.000.

Wall, Lars E.; and Jonsson, John E., to Telefonaktiebolaget LM Ericsson. Method and apparatus for correcting distortion in an image which is recorded electronically and built up along lines. 4,551,752, Cl. 358-113.000.

Wallace, Charles H. Method for changing the internal temperature of meat by the use of gas. 4,551,338, Cl. 426-281.000.

Walles, Erik W.: *See*—
Howell, Bobby A.; and Walles, Erik W., 4,551,502, Cl. 525-326.900.

Walsh, Thomas J.: *See*—
Wiese, John R.; and Walsh, Thomas J., 4,550,620, Cl. 73-864.550.

Walter, Lothar; and Reith, Walter, to SKF Kugellagerfabriken GmbH. Process for the production of a heat treated bearing ring. 4,550,479, Cl. 29-148.40C.

Wang, Hsin-Ju: *See*—
Ramella, Amilcare; and Wang, Hsin-Ju, 4,551,228, Cl. 208-65.000.

Warashina, Tomio: *See*—
Okumura, Takeshi; Warashina, Tomio; and Nakanishi, Kiyoshi, 4,550,699, Cl. 123-308.000.

Warlaumont, John M.: *See*—
Di Milia, Vincent; Maldonado, Juan R.; Speidell, James L.; and Warlaumont, John M., 4,551,192, Cl. 156-345.000.

Warner, Anne, to National Research Development Corporation. Mycorrhizal seed pellets. 4,551,165, Cl. 71-24.000.

Warner-Lambert Company: *See*—
Butler, Donald E., 4,551,470, Cl. 514-413.000.
Kern, Donald L.; Hokanson, Gerard C.; and French, James C., 4,551,529, Cl. 544-265.000.
Nunez, Chris E., 4,550,748, Cl. 137-605.000.

Warren, Robert F.: *See*—
Pipa, William; Warren, Robert F.; and Russack, Harvey, 4,550,679, Cl. 118-52.000.

Watanabe, Akikazu: *See*—
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, 4,551,571, Cl. 585-440.000.

Watanabe, Fumio: *See*—
Shimoda, Michio; and Watanabe, Fumio, 4,551,805, Cl. 364-469.000.

Watanabe, Hisashi, to Fujitsu Limited. Package for semiconductor device. 4,551,745, Cl. 357-72.000.

Watanabe, Kazuhide: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,550,744, Cl. 137-80.000.

Watanabe, Ryuji; Ando, Hisashi; Kuniya, Keiichi; and Kurosawa, Yukio, to Hitachi, Ltd. Surge-absorberless vacuum circuit interrupter. 4,551,596, Cl. 200-144.00B.

Watanabe, Takeo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.

Watanabe, Tatsuya: *See*—
Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, 4,551,849, Cl. 381-86.000.

Watts, George T.; and Thaden, Theron J., to Goodyear Tire & Rubber Company, The. Tire packaging. 4,550,827, Cl. 206-304.000.

Wayne Automation Corp.: *See*—
Johnson, A. David, Jr.; Bachman, Joseph L., Jr.; Ginther, George E., Sr.; Zimmermann, Charles E.; and Johnson, Albert D., Sr., 4,551,126, Cl. 493-453.000.

Webb, Tommy W.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Lange, Robert E.; and Webb, Tommy W., 4,550,657, Cl. 100-43.000.

Weber, Georg: *See*—
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, 4,551,264, Cl. 252-299.620.

Weber, Wolfram: *See*—
Mathieu, Bernd; and Weber, Wolfram, 4,551,147, Cl. 604-405.000.

Webers, Vincent J.: *See*—
Cohen, Abraham B.; and Webers, Vincent J., 4,551,415, Cl. 430-281.000.

Weeder, Ralph E. Planter population reduction drive unit. 4,550,860, Cl. 222-615.000.

Wehinger, Egbert; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Vasodilating cyanoalkyl esters of 1,4-dihydropyridines. 4,551,467, Cl. 514-334.000.

Wei, Peter H. L.; and Carlson, Richard P., to American Home Products Corporation. Phenylpyrazolidine acetic acid derivatives. 4,551,538, Cl. 548-367.000.

Weigel, Horst: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,551,548, Cl. 562-402.000.

Weinberg, Gerd: *See*—
Traumuller, Otfried; and Weinberg, Gerd, 4,550,832, Cl. 206-509.000.
Traumuller, Otfried; and Weinberg, Gerd, 4,550,847, Cl. 220-4.00F.

Weindl, Alfred: *See*—
Wottka, Bernhard; and Weindl, Alfred, 4,551,294, Cl. 264-175.000.

Weisenberger, Johannes M.: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,551,464, Cl. 514-312.000.

Weishaupt, Walter: *See*—
Bourauel, Fritz; and Weishaupt, Walter, 4,551,703, Cl. 340-52.00D.

Weiss, Franz-Josef: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,551,318, Cl. 423-265.000.

Weissberger, Edward: *See*—
Brust, David P.; Neumann, Stephen M.; and Weissberger, Edward, 4,551,411, Cl. 430-216.000.

Welburn, Ross D., to Motornetics Corporation. Reactance-commutated high resolution servo motor system. 4,551,708, Cl. 340-347.0SY.

Weldon, Scott B., to Crown Zellerbach Corporation. Apparatus and process for treating web material. 4,551,199, Cl. 162-109.000.

Welfle, Kurt: *See*—
Tamm, Franz; Horicke, Bernhard; Welfle, Kurt; Seidel, Michael; Tettke, Wolfgang; and Luckfiel, Karl-Heinz, 4,551,183, Cl. 148-12.00R.

Wellington, Charles H.: *See*—
Carmichael, Jerry H.; and Wellington, Charles H., 4,551,823, Cl. 367-35.000.

Werkzeugmaschinenfabrik Oerlikon-Buehrle AG: *See*—
Harter, Robert R., 4,550,640, Cl. 89-1.806.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Bruderer, Werner; Brieger, Hans; and Hurlemann, Ernst, 4,550,641, Cl. 89-12.000.
Grabher, Erich; Muller, Max; Wetzel, Horst; and Schultschik, Robert, 4,550,955, Cl. 308-6.00C.
Schultschik, Robert, 4,551,044, Cl. 408-185.000.

Werner, Wolfgang: *See*—
Berger, Dieter; Frey, Gunter; Knappe, Wolfgang-Reinhold; Kuhr, Manfred; Rittersdorf, Walter; and Werner, Wolfgang, 4,551,428, Cl. 435-19.000.

Werth, Larry J.; and Paulson, Larry G., to Pattern Processing Technologies, Inc. Response detector for pattern processing system. 4,551,850, Cl. 382-18.000.

West Company, The: *See*—
Sutryn, Caroll S.; and Maietta, Michael G., 4,550,825, Cl. 206-222.000.

West, Dan: *See*—
Snetting, Mark; West, Dan; and Hacker, John R., 4,550,919, Cl. 277-23.000.

West, James C.; and Gesell, Elmer G., to Outboard Marine Corporation. Die casting process using disposable inserts during warm up. 4,550,762, Cl. 164-98.000.

Westinghouse Electric Corp.: *See*—
Goldstein, Norman P.; and Lane, Stephen A., 4,551,298, Cl. 376-245.000.
Maier, Alfred E., 4,551,597, Cl. 200-249.000.
Shields, Edward P., 4,551,299, Cl. 376-261.000.
Stough, Donald M., 4,551,088, Cl. 431-76.000.
Veronesi, Luciano; and Sherwood, Donald G., 4,550,941, Cl. 294-86.400.
Wilks, Robert S., 4,550,494, Cl. 29-838.000.

Westvaco Corporation: *See*—
Dilling, Peter, 4,551,151, Cl. 8-524.000.

Wetzel, Horst: *See*—
Grabher, Erich; Muller, Max; Wetzel, Horst; and Schultschik, Robert, 4,550,955, Cl. 308-6.00C.

Wheeler, Thomas N., to Union Carbide Corporation. Biocidal 2-aryl-1, 3-cyclopentanedione enol ester compounds. 4,551,547, Cl. 560-255.000.

Whirlpool Corporation: *See*—
Keane, James W., 4,550,957, Cl. 339-5.00R.
Smith, Orbert S., 4,550,958, Cl. 339-5.00R.
Tate, Ralph, Jr.; and Woods, John T., 4,550,576, Cl. 62-441.000.

White, Anthony M.: *See*—
Elliott, Charles T.; and White, Anthony M., 4,551,623, Cl. 250-211.00R.

White Consolidated Industries, Inc.: *See*—
Nussdorfer, William R.; Brancheau, Harry A.; and Clark, Steven C., 4,550,770, Cl. 165-29.000.

White, Robert: *See*—
Baker, Hugh W. B.; and White, Robert, 4,551,035, Cl. 401-104.000.

White, Robert M.: *See*—
Batina, William P.; and White, Robert M., 4,550,731, Cl. 128-419.0PT.

Whitford, Alan, to Superior Plastic Products Corp. Strip of detachably connected bags for medical supplies. 4,550,831, Cl. 206-439.000.

Whiting, Graham J.: *See*—
Baker, Hugh W. B.; and Whiting, Graham J., 4,551,038, Cl. 401-265.000.

Whitlam, Joseph E.; and Richards, Alwyn H., to Stevecleave Limited. Scaffolding. 4,550,541, Cl. 52-309.800.

Whitley, Ray D. Hose holding device. 4,550,892, Cl. 248-90.000.

Whitt, Joade: *See*—
Bell, John R.; Scoville, Robert E.; and Whitt, Joade, 4,550,867, Cl. 222-607.000.

Wiegard, Klaus; Kinast, Karlheinz; Kleinekathofer, Wolfgang; and Tank, Eggert, to Daimler-Benz Aktiengesellschaft. Sliding material for seals on rotary regenerative heat exchangers with a ceramic core. 4,551,396, Cl. 428-678.000.

Wiersema, Delbert; and Szmadzinski, John A., to Herman Miller, Inc. Hanger clip for retaining a component to a slotted upright. 4,550,893, Cl. 248-222.400.

Wiese, John R.; and Walsh, Thomas J., to General Signal Corporation. End-filling sampler for molten metals. 4,550,620, Cl. 73-864.550.

Wiley, William E., to Kamyr, Inc. Method of flashing black liquor. 4,551,198, Cl. 159-47.300.

Wilkins, Cletus W., Jr.: *See*—
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,551,416, Cl. 430-311.000.

Wilkinson, Robert E.: *See*—
Epel, Joseph N.; and Wilkinson, Robert E., 4,551,085, Cl. 425-405.00R.

Wilks, Robert S., to Westinghouse Electric Corp. Automated printed circuit board assembly method. 4,550,494, Cl. 29-838.000.

Willcott, M. Robert: *See*—
Morgan, Tommie J.; and Willcott, M. Robert, 4,551,678, Cl. 324-300.000.

Willson, Carlton G.: *See*—
Hult, Anders; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,551,418, Cl. 430-325.000.

Wilson, Alex T., to Duval Corporation. Recovery of gold. 4,551,213, Cl. 204-111.000.

Wilson, Frank, to Chloride, Inc. Method of suppressing lead dust. 4,551,401, Cl. 429-122.000.

Wilson, John R.: *See*—
Smith, Richard R.; and Wilson, John R., 4,551,368, Cl. 428-35.000.

Wilson, Peter H., to Black & Decker Inc. Guard for hot air gun. 4,551,615, Cl. 219-373.000.

Wilson, W. Donald: *See*—
Tateosian, Louis H.; and Wilson, W. Donald, 4,551,486, Cl. 523-212.000.

Winter, David F.; and Dick, William K., to ITT Corporation. Electronic grounding system for electrical distribution systems. 4,551,633, Cl. 307-147.000.

Wirth, Ricky C.: *See*—
Teerman, Richard F.; Bosch, Russell H.; and Wirth, Ricky C., 4,550,875, Cl. 239-88.000.

Wischusen, Henry, III: *See*—
Fletcher, Richard J.; and Wischusen, Henry, III, 4,550,834, Cl. 206-611.000.

Wiser, James G.: *See*—
Lundahl, E. Cordell; Wiser, James G.; Thornley, W. Ray; and Jensen, Laurel H., 4,550,554, Cl. 56-294.000.

Wishman, Marvin, to Phillips Petroleum Company. Method and apparatus for absorbing moisture. 4,550,725, Cl. 128-155.000.

Woebcke, Herman N.: *See*—
Bhojwani, Arju H.; and Woebcke, Herman N., 4,550,769, Cl. 165-1.000.

Woffinden, Gary A.: *See*—
Amdahl, Gene M.; Hanson, Donald L.; Kreuzenstein, Ronald K.; Roshon-Larsen, Gwynne L.; and Woffinden, Gary A., 4,551,797, Cl. 364-200.000.

Wolfe, Susan V.: *See*—
Cranfield, Brain A.; Fothergill, John C.; and Wolfe, Susan V., 4,551,499, Cl. 524-487.000.

Wolter, Gerry. Gas instantaneous water heater. 4,550,689, Cl. 122-448.00R.

Wolters, Gerd-Michael: *See*—
Deutschmann, Herbert; and Wolters, Gerd-Michael, 4,550,568, Cl. 60-612.000.

Won, Vann Y. Fuel vapor generator. 4,551,153, Cl. 48-102.00R.

Wondergem, Jan: *See*—
Vissers, Hermanus H.; and Wondergem, Jan, 4,550,557, Cl. 56-341.000.

Wong, Harvey C.; and Lin, Frank W., to Mechatron Systems, Inc. Velocity-position servo with improved gain control. 4,551,664, Cl. 318-592.000.

Wood, Bernard J.; Brittain, Robert D.; and Sancier, Kenneth M., to SRI International. In situ formation of coal gasification catalysts from low cost alkali metal salts. 4,551,155, Cl. 48-197.00R.

Woodall, Jerry M.: *See*—
Chappell, Barbara A.; Chappell, Terry I.; and Woodall, Jerry M., 4,550,489, Cl. 29-571.000.

Woods, John T.: *See*—
Tate, Ralph, Jr.; and Woods, John T., 4,550,576, Cl. 62-441.000.

Woodworth, Raymond D.; Stoutamore, James F.; and Vanderhoek, Philip S., to Digital Hydraulics, Inc. Digital fluid pressure flow rate and position control system. 4,550,747, Cl. 137-487.500.

Worthington, Paul A.: *See*—
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,551,469, Cl. 514-383.000.

Wottka, Bernhard; and Weindl, Alfred, to Heochst Aktiengesellschaft. Molding composition based on vinyl chloride polymers, and process for the manufacture of films from these molding compositions for the production of forgery-proof valuable documents. 4,551,294, Cl. 264-175.000.

Wright, John N.: *See*—
Maslak, Samuel H.; and Wright, John N., 4,550,607, Cl. 73-626.000.

Wright, Richard F.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,551,407, Cl. 430-138.000.

Wright, Robert C.: *See*—
Guilmette, Joseph G.; and Wright, Robert C., 4,551,197, Cl. 156-642.000.

Wright, William S., Jr., to Pacific Scientific Company. System for monitoring snubber loads. 4,550,589, Cl. 73-11.000.

Wronski, Stanislaw: *See*—
Mroz, Andrzej; and Wronski, Stanislaw, 4,551,242, Cl. 209-211.000.

Wu, Chialin: *See*—
Goldstein, Richard M.; Caro, Edward R.; and Wu, Chialin, 4,551,724, Cl. 343-5.0CM.

Xerox Corporation: *See*—
Banton, Martin E., 4,551,008, Cl. 355-14.00E.
DiNatale, Ernest L.; and Yax, Robert J., 4,551,784, Cl. 361-225.000.
Elter, Michael R., 4,551,007, Cl. 355-14.0FU.
Goemans, Hermanus I., 4,551,015, Cl. 355-75.000.
Moore, Kenneth P., 4,550,903, Cl. 271-98.000.
Paraskevopoulos, Demetris E., 4,551,004, Cl. 355-3.0DD.

Yada, Isao: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Satonaka, Shinobu; and Kaminaga, Seiji, 4,551,009, Cl. 355-15.000.

Yaguchi, Masachika; Mikami, Tomoki; and Hase, Takashi, to Kasei Optonix, Ltd. Zinc silicate phosphor and electron excited fluorescent display device using the phosphor. 4,551,397, Cl. 428-691.000.

Yamada, Akira: *See*—
Yoshida, Takumori; Yamada, Akira; and Shinmura, Sadayuki, 4,550,700, Cl. 123-432.000.

Yamada, Kazuji; Kobori, Shigeyuki; Shimada, Satoshi; Kanzawa, Ryosaku; Kobayashi, Ryoichi; and Sato, Hideo, to Hitachi, Ltd. Integrated pressure sensor. 4,550,612, Cl. 73-727.000.

Yamada, Masato: *See*—
Akisue, Osamu; Yamada, Teruaki; Ueda, Shigeru; Tokunaga, Yoshikuni; and Yamada, Masato, 4,551,182, Cl. 148-12.00C.

Yamada, Noriaki: *See*—
Hayakawa, Masanori; Yamada, Noriaki; Kawamoto, Hiromi; and Nishimura, Satoshi, 4,551,260, Cl. 252-62.590.

Yamada, Sadahiko: *See*—
Harada, Masato; Miya, Shinya; Yamada, Sadahiko; and Iijima, Makoto, 4,551,439, Cl. 502-107.000.

Yamada, Teruaki: *See*—
Akisue, Osamu; Yamada, Teruaki; Ueda, Shigeru; Tokunaga, Yoshikuni; and Yamada, Masato, 4,551,182, Cl. 148-12.00C.

Yamaguchi, Nobutaka; Iida, Shinobu; Utsumi, Masahiro; Okutu, Toshimitu; Masuyama, Kenichi; and Tadokoro, Eiichi, to Fuji Photo Film Co., Ltd. Magnetic recording materials. 4,551,386, Cl. 428-323.000.

Yamaguchi, Satoru: *See*—
Takahashi, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, 4,551,634, Cl. 307-243.000.

Yamaguchi, Tsutomu: *See*—
Kubo, Takeshi; Kawano, Junji; Takahashi, Fumio; and Yamaguchi, Tsutomu, 4,551,729, Cl. 346-1.100.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshida, Takumori; Yamada, Akira; and Shinmura, Sadayuki, 4,550,700, Cl. 123-432.000.

Yamamoto, Akito: *See*—
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, 4,551,803, Cl. 364-431.050.

Yamamoto, Kazuyuki: *See*—
Sekiguchi, Koichi; Takematsu, Hikaru; Yamamoto, Kazuyuki; and Kubo, Teruyuki, 4,551,583, Cl. 179-99.00M.

Yamamoto, Tadashi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; and Ueno, Hiroshi, 4,551,440, Cl. 502-119.000.

Yamamuro, Kiyohiko: *See*—
Ikeda, Tadashi; Kuwabara, Kenichi; Yamamuro, Kiyohiko; and Kokubo, Tadayoshi, 4,551,424, Cl. 430-588.000.
Yamanaga, Nobuki, to Ye Data Inc. Hammer driving circuit for a dot system line printer. 4,550,659, Cl. 101-93.040.
Yamanaka, Eisuke: *See*—
Ehiro, Takashi; Tanaka, Teruaki; and Yamanaka, Eisuke, 4,550,582, Cl. 72-234.000.
Yamanaka, Seisuke: *See*—
Sase, Masatoshi; and Yamanaka, Seisuke, 4,551,761, Cl. 358-213.000.
Yamatsu, Kiyomi: *See*—
Tachibana, Shinro; Ohya, Shizuko; Arakawa, Yoshihiro; Nakazawa, Takahiro; Kaneko, Takeru; Ikeda, Masuhiro; and Yamatsu, Kiyomi, 4,551,273, Cl. 260-112.50E.
Yamauchi, Shingo: *See*—
Ogawa, Masashi; Nakamura, Taku; Urata, Yukihide; and Yamauchi, Shingo, 4,551,412, Cl. 430-265.000.
Yamazaki, Hideo: *See*—
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, 4,551,478, Cl. 514-603.000.
Yamazaki, Hiroaki: *See*—
Tamura, Tadashi; Nakao, Etsuro; and Yamazaki, Hiroaki, 4,551,402, Cl. 429-254.000.
Yamazaki, Kazuhiro: *See*—
Ohtake, Etsuo; and Yamazaki, Kazuhiro, 4,551,389, Cl. 428-402.000.
Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kumazawa, Satoru; Shimizu, Susumu; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; Chida, Tsuneaki; Arabori, Hideo; and Watanabe, Takeo, 4,551,168, Cl. 71-90.000.
Yamazaki, Yoshinori; and Ogawa, Tsutomu, to Kabushiki Kaisha Miyano Tekkosho. Indexing system of machine tools and the like. 4,550,631, Cl. 74-822.000.
Yamazawa, Akira: *See*—
Ishikawa, Takehiro; Yamazawa, Akira; and Kusumoto, Yasuo, 4,551,031, Cl. 374-117.000.
Yanagishima, Takayuki: *See*—
Kasai, Junichi; Yanagishima, Takayuki; Ajimine, Akio; Murakami, Yoshiaki; Shino, Akimitsu; and Watanabe, Tatsuya, 4,551,849, Cl. 381-86.000.
Yanagita, Hirohisa: *See*—
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, 4,551,478, Cl. 514-603.000.
Yaniv, Moshe: *See*—
Danos, Olivier; Katinka, Michael; and Yaniv, Moshe, 4,551,270, Cl. 260-112.50R.
Yarimizu, Kenichi, to Nippon Oil Seal Industry Co., Ltd. Method and apparatus for mounting oil seal in machine housing. 4,550,486, Cl. 29-451.000.
Yarnell, James A., to Dana Corporation. Transmission interlock system. 4,550,628, Cl. 74-477.000.
Yaroshenko, Galina F.: *See*—
Samakaev, Rafail K.; Paguba, Alexandr I.; Smolnikov, Nikolai V.; Dytjuk, Leonid T.; Gusev, Vladimir I.; Dyatlova, Nina M.; Yaroshenko, Galina F.; Barsukov, Anatoly V.; Krinitskaya, Ljudmila V.; and Balashova, Taisia M., 4,551,262, Cl. 252-181.000.
Yashfe, Yechiel. Rapid-heating electric water boiler. 4,551,613, Cl. 219-316.000.
Yasumoto, Hidetoshi: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Kawagoe, Nobukazu; Naruse, Kazuhiko; and Inaba, Masahito, 4,551,011, Cl. 355-35.000.
Yax, Robert J.: *See*—
DiNatale, Ernest L.; and Yax, Robert J., 4,551,784, Cl. 361-225.000.
Ye Data Inc.: *See*—
Yamanaga, Nobuki, 4,550,659, Cl. 101-93.040.
Yeater, Robert P.; Pantone, Richard S.; and Rieck, James N., to Mobay Chemical Corporation. Polyether polyurethane prepolymers containing finely divided inorganic particles and cast elastomers made therefrom. 4,551,498, Cl. 524-424.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,551,207, Cl. 203-56.000.
Yessian, Richard J.: *See*—
Dow, John, Jr.; Oetting, William A.; and Yessian, Richard J., 4,550,859, Cl. 222-26.000.
Yglesia, Larry: *See*—
Daniel, Robert P.; and Yglesia, Larry, 4,551,788, Cl. 361-403.000.
Yokota, Takashi. Recording apparatus using a recording member in endless belt form. 4,551,001, Cl. 355-3.0BE.
Yokouchi, Hiroshi; and Iketani, Ryuichi, to Oki Electric Industry Co., Ltd. Data bus precharging circuits. 4,551,821, Cl. 365-203.000.
Yonahara, Kunio: *See*—
Fushimi, Kazuo; Tsunakawa, Hirokazu; and Yonahara, Kunio, 4,551,267, Cl. 252-511.000.
Yoshida Kogyo K.K.: *See*—
Iai, Kenichiro, 4,550,477, Cl. 29-33.200.
Yoshida, Takumori; Yamada, Akira; and Shinmura, Sadayuki, to Yamaha Hatsudoki Kabushiki Kaisha. Intake system for multi-intake valve type engine. 4,550,700, Cl. 123-432.000.
Yoshida, Tatsuya: *See*—
Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, 4,550,705, Cl. 123-488.000.
Yoshimoto, Tekeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Yamazaki, Hideo; Takasawa, Yoshio; and Yanagita, Hirohisa, to Mitsui Toatsu Chemicals, Inc. 3-Nitrobenzene sulfonanilide derivatives and fungicidal compositions for the control of plant diseases containing same. 4,551,478, Cl. 514-603.000.
Yoshimura, Noriaki: *See*—
Matsumoto, Mitsuo; Hirai, Koji; Yoshimura, Noriaki; and Okamura, Takayuki, 4,551,518, Cl. 528-80.000.
Yoshinaga, Toru: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,550,744, Cl. 137-80.000.
Yoshino, Yasuo: *See*—
Sarumaru, Kohei; Iwakura, Tomoatsu; Yoshino, Yasuo; Ito, Toshimichi; Watanabe, Akikazu; and Mori, Mikio, 4,551,571, Cl. 585-440.000.
Yoshinori Kidani: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,551,524, Cl. 536-121.000.
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, to Mita Industrial Co., Ltd. Electrostatic copying process. 4,551,013, Cl. 355-55.000.
Yoshioka, Yoshio: *See*—
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, 4,551,532, Cl. 546-22.000.
Yoshitomi, Toshihiko: *See*—
Takahashi, Kiyoshi; Konagai, Makoto; Yoshitomi, Toshihiko; and Omori, Takeshi, 4,551,575, Cl. 136-255.000.
Yotsuami Limited: *See*—
Nakanishi, Hitoshi; and Ogura, Hiroyuki, 4,550,938, Cl. 289-1.200.
Young, Donald C.; and Green, James A., II, to Union Oil Company of California. Method of soil nitrification inhibition by application of a stabilized fumigant composition. 4,551,167, Cl. 71-64.100.
Young, James V.: *See*—
Muchisky, Thomas P.; and Young, James V., 4,550,901, Cl. 269-328.000.
Young, John S.: *See*—
Daniels, William R.; and Young, John S., 4,551,585, Cl. 179-175.30R.
Yu, Ho; and Ai, Daniel K., to Aluminum Company of America. Roll caster apparatus having uniform flow of molten metal into novel nozzle tip assembly. 4,550,767, Cl. 164-428.000.
Yu, Ho: *See*—
Ai, Daniel K.; and Yu, Ho, 4,550,766, Cl. 164-428.000.
Yuasa, Yoshio; Yasumoto, Hidetoshi; Kawagoe, Nobukazu; Naruse, Kazuhiko; and Inaba, Masahito, to Minolta Camera Kabushiki Kaisha. Light source for exposure. 4,551,011, Cl. 355-35.000.
Yui, George M. Toilet-bowl bidet apparatus. 4,550,454, Cl. 4-420.400.
Yuill, William A., to Atlantic Richfield Company. Process for converting molybdenite to molybdenum oxide. 4,551,312, Cl. 423-53.000.
Yuyama, Yukihiro: *See*—
Maruta, Keiichi; and Yuyama, Yukihiro, 4,551,738, Cl. 346-200.000.
Zadak, Zdenek: *See*—
Skvara, Frantisek; Kolar, Karel; Zadak, Zdenek; Friml, Zdenek; and Novotry, Jaroslav, 4,551,176, Cl. 106-90.000.
Zakiewicz, Bohdan M. Process for the recovery of hydrocarbons for mineral oil deposits. 4,550,779, Cl. 166-248.000.
Zambolin, Marco. Process and apparatus for reducing the temperature gradient in buildings. 4,550,649, Cl. 98-39.100.
Zatek, Kazimierz. Boat hull planking method. 4,550,674, Cl. 114-358.000.
Zdziarski, Stanley F.: *See*—
Retsch, William H.; and Zdziarski, Stanley F., 4,550,900, Cl. 269-87.000.
Zegers de Beyl, Rene H.; and Coble, Stephen J., to American Hospital Supply Corporation. Patient controlled medication infusion system. 4,551,133, Cl. 604-66.000.
Zemel, Jay N., to University of Pennsylvania, Trustees of the. Pyroelectric gas sensor. 4,551,425, Cl. 435-4.000.
Zentner, Harry, to Mauri Brothers & Thomson (Aust.) Pty. Limited. Dough improver. 4,551,334, Cl. 426-26.000.
Zepell, June R. G.: *See*—
Zepell, Nathan A., 4,551,034, Cl. 401-104.000.
Zepell, Nathan A., to Zepell, June R. G. Clip mount insert. 4,551,034, Cl. 401-104.000.
Ziaylek, Theodore, Jr. Wheeled container, especially for use by firefighting and rescue squads. 4,550,931, Cl. 280-655.000.
Ziegenhorn, Joachim: *See*—
Draeger, Brigitte; and Ziegenhorn, Joachim, 4,551,427, Cl. 435-14.000.
Zimmer, Johannes; and Mayer, Karl, to Zimmer, Johannes. Applicator for uniformly distributing a flowable material over a receiving surface. 4,550,681, Cl. 118-410.000.
Zimmerman, Gregory L. Hydrostatic lubrication system for a walking beam. 4,550,805, Cl. 184-18.000.
Zimmermann, Charles E.: *See*—
Johnson, A. David, Jr.; Bachman, Joseph L., Jr.; Ginther, George E., Sr.; Zimmermann, Charles E.; and Johnson, Albert D., Sr., 4,551,126, Cl. 493-453.000.
Zoller-Kipper GmbH: *See*—
Naab, Jakob, 4,551,057, Cl. 414-420.000.
Zuber, Thierry; and Traiteur, Rene , to Novatome; and Commissariat a l'Energie Atomique. Steam outlet connection for a steam generator. 4,550,688, Cl. 122-360.000.

Zucker, Armand S.: *See*—
Nathan, Walter; and Zucker, Armand S., 4,550,838, Cl. 211-128.000.
Zupan, Marko: *See*—
Zupancic, Natasa; Sket, Boris; Zupet, Pavel; and Zupan, Marko, 4,551,525, Cl. 544-49.000.
Zupancic, Natasa; Sket, Boris; Zupet, Pavel; and Zupan, Marko, to KRKA, tovarna zdravil, n.sol.o. Process for preparing N-(2-pyridyl)-2-methyl-4-hydroxy-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxide. 4,551,525, Cl. 544-49.000.
Zupet, Pavel: *See*—
Zupancic, Natasa; Sket, Boris; Zupet, Pavel; and Zupan, Marko, 4,551,525, Cl. 544-49.000.
zur Hausen, Manfred: *See*—
Otte, Werner; Nehring, Rudolf; and zur Hausen, Manfred, 4,551,564, Cl. 568-834.000.
Zwaskis, William J.: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,550,729, Cl. 128-325.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF NOVEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abel, Helmut. Multiple-purpose saw blade suspension arrangement for reciprocating saws. Re. 32,020, Cl. 83-783.000.

AHI Operations Limited: *See—*
Phillips, Dougald S. M.; and Phillips, Peter A. J., Re. 32,019, Cl. 73-304.00R.

America's Cup, Inc.: *See—*
Harr, Robert G.; and Soli, Gaylord T., Re. 32,023, Cl. 441-112.000.

Calvert, Edmund, administrator: *See—*
Parker, Clive; Pearl, Antony, deceased; and Calvert, Edmund, administrator, Re. 32,022, Cl. 356-307.000.

Domke, Klaus; and Saur, Walter, to Robert Bosch GmbH. Method of producing sealed packaging containers. Re. 32,018, Cl. 53-480.000.

Globol-Werk GmbH: *See—*
Hautmann, Horst; and Schimanski, Georg, Re. 32,017, Cl. 4-231.000.

Greig, John H., to MSI Electronics Inc. Mercury probe. Re. 32,024, Cl. 324-158.00F.

Harr, Robert G.; and Soli, Gaylord T., to America's Cup, Inc. Flotation vest. Re. 32,023, Cl. 441-112.000.

Hautmann, Horst; and Schimanski, Georg, to Globol-Werk GmbH. Toilet flush water colorizer. Re. 32,017, Cl. 4-231.000.

Lone Star Medical Products, Inc.: *See—*
Scott, Frank B., Jr., Re. 32,021, Cl. 128-20.000.

MSI Electronics Inc.: *See—*
Greig, John H., Re. 32,024, Cl. 324-158.00F.

Parker, Clive; Pearl, Antony, deceased; and by Calvert, Edmund, administrator, to Varian Associates, Inc. Atomic absorption spectroscopy. Re. 32,022, Cl. 356-307.000.

Pearl, Antony, deceased: *See—*
Parker, Clive; Pearl, Antony, deceased; and Calvert, Edmund, administrator, Re. 32,022, Cl. 356-307.000.

Phillips, Dougald S. M.; and Phillips, Peter A. J., to AHI Operations Limited. Methods of and/or means for indicating the levels of liquids. Re. 32,019, Cl. 73-304.00R.

Phillips, Peter A. J.: *See—*
Phillips, Dougald S. M.; and Phillips, Peter A. J., Re. 32,019, Cl. 73-304.00R.

Robert Bosch GmbH: *See—*
Domke, Klaus; and Saur, Walter, Re. 32,018, Cl. 53-480.000.

Saur, Walter: *See—*
Domke, Klaus; and Saur, Walter, Re. 32,018, Cl. 53-480.000.

Schimanski, Georg: *See—*
Hautmann, Horst; and Schimanski, Georg, Re. 32,017, Cl. 4-231.000.

Scott, Frank B., Jr., to Lone Star Medical Products, Inc. Surgical retractor utilizing elastic tubes frictionally held in spaced notches. Re. 32,021, Cl. 128-20.000.

Soli, Gaylord T.: *See—*
Harr, Robert G.; and Soli, Gaylord T., Re. 32,023, Cl. 441-112.000.

Varian Associates, Inc.: *See—*
Parker, Clive; Pearl, Antony, deceased; and Calvert, Edmund, administrator, Re. 32,022, Cl. 356-307.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See—*
Ulmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, B1 3,928,163, Cl. 204-205.000.

Dentsply Research & Development Corp.: *See—*
Dougherty, Emery W.; and Welsh, Richard E., B1 4,330,280, Cl. 433-90.000.

Dougherty, Emery W.; and Welsh, Richard E., to Dentsply Research & Development Corp. Ejector holder for capsule-like cartridge. B1 4,330,280, 11-5-85, Cl. 433-90.000.

Emhart Industries, Inc.: *See—*
Perry, Leroy A.; and Scott, Charles E., B1 4,370,566, Cl. 307-141.000.

Fenner, Hans-Ueli: *See—*
Ulmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, B1 3,928,163, Cl. 204-206.000.

Keeri-Szanto, Michael. Device for monitoring and controlling self-administered intravenous drug dosage. B1 4,275,727, 11-5-85, Cl. 604-66.000.

Kohaut, John E., to Raceway Components, Inc. Apparatus for sealing passages through a concrete floor and about a conductor. B1 4,099,020, 11-5-85, Cl. 174-48.000.

Mattei, Silvano: *See—*
Ulmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, B1 3,928,163, Cl. 204-206.000.

Perry, Leroy A.; and Scott, Charles E., to Emhart Industries, Inc. Appliance control system. B1 4,370,566, 11-5-85, Cl. 307-141.000.

Raceway Components, Inc.: *See—*
Kohaut, John E., B1 4,099,020, Cl. 174-48.000.

Schumacher, Bernd: *See—*
Ulmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, B1 3,928,163, Cl. 204-206.000.

Scott, Charles E.: *See—*
Perry, Leroy A.; and Scott, Charles E., B1 4,370,566, Cl. 307-141.000.

Sieg, Arno: *See—*
Ulmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, B1 3,928,163, Cl. 204-206.000.

Ulmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Spark discharge and electro-chemical erosion machining apparatus. B1 3,928,163, 11-5-85, Cl. 204-206.000.

Welsh, Richard E.: *See—*
Dougherty, Emery W.; and Welsh, Richard E., B1 4,330,280, Cl. 433-90.000.

LIST OF DESIGN PATENTEES

Aebersold, Larry A.: *See—*
Johnson, David E.; Aebersold, Larry A.; and McCall, Kenneth E., 281,250, Cl. D15-144.000.

Akiyama, Kunio, to Sharp Corporation. POS (Point-of-sales) cash register. 281,254, 11-5-85, Cl. D18-4.000.

Amabili, Arnaldo. Egg container. 281,226, 11-5-85, Cl. D9-341.000.

Amba Marketing Systems, Inc.: *See—*
Schimmel, Otto K., 281,201, Cl. D3-53.000.

AMC Appliances, division of Algonquin Mercantile Corporation: *See—*
Lastuck, Leonard V., 281,215, Cl. D7-363.000.

American Cyanamid Co.: *See—*
Morgan, John H.; and Grip, John A., 281,228, Cl. D9-404.000.

Appleby, Joan. Food chopping board. 281,212, 11-5-85, Cl. D7-46.000.

Aqua-Leisure Industries, Inc.: *See—*
Fireman, Simon C., 281,224, Cl. D9-337.000.

Arcair Company: *See—*
Johnson, David E.; Aebersold, Larry A.; and McCall, Kenneth E., 281,250, Cl. D15-144.000.

Armbruster, Joseph M., to Eagle-Picher Industries, Inc. Cabinet for video cassettes or the like. 281,207, 11-5-85, Cl. D6-407.000.

Artwick, Kert E., to Leslie-Locke, Inc. Self-closing ventilation louver. 281,273, 11-5-85, Cl. D23-151.000.

Aspen Ribbons, Inc.: *See—*
Schiffmacher, William M., 281,258, Cl. D18-22.000.

Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., to Singer Company, The. Router. 281,218, 11-5-85, Cl. D8-67.000.

Beach, Wilma R., to Daniel E. Gelles Associates, Inc. Article display bracket. 281,211, 11-5-85, Cl. D6-572.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Printing ribbon cartridge. 281,257, 11-5-85, Cl. D18-22.000.

Best, Melvin H., to Glastar Corporation. Strip cutter. 281,219, 11-5-85, Cl. D8-98.000.

Bieger, Walter I.: *See—*
Olson, David V.; and Bieger, Walter I., 281,230, Cl. D9-434.000.

Bio-Support Industries Ltd: *See—*
Roberts, Frank L., 281,210, Cl. D6-502.000.

Blankenship, Larry K.; and Manno, Joseph, to Vitalmetrics, Inc. Electronic urine monitor. 281,278, 11-5-85, Cl. D24-17.000.

Burke, Bradley: *See—*
Schosser, John F.; Gleason, Roger K.; Dole, Charles M.; Us, Max; and Burke, Bradley, 281,280, Cl. D26-46.000.

Burlington Industries, Inc.: *See—*
Cochran, James A., 281,231, Cl. D9-456.000.

Burns, Edward M. Stand for computer disks. 281,209, 11-5-85, Cl. D6-468.000.

Busse, Rido, to Soehnle-Waagen GmbH & Co. Household scale. 281,235, 11-5-85, Cl. D10-91.000.

Canon Kabushiki Kaisha: *See—*
Nibley, Richard; and Kondo, Hiroatsu, 281,255, Cl. D18-12.000.

Cazier, Monty N. Insect cage. 281,283, 11-5-85, Cl. D30-1.000.

Christie, Cornelius W., to SCM Corporation. Typewriter. 281,253, 11-5-85, Cl. D18-1.000.

Citizen Watch Co., Ltd.: *See—*
Ohtsu, Yutaka, 281,244, Cl. D14-77.000.

Cochran, James A., to Burlington Industries, Inc. Divider for separating stacked articles. 281,231, 11-5-85, Cl. D9-456.000.

Craft, Hugh R.: *See—*
Cutliff, Norman J., Jr.; and Craft, Hugh R., 281,216, Cl. D8-26.000.

Cutliff, Norman J., Jr.; and Craft, Hugh R. Fireman's tool. 281,216, 11-5-85, Cl. D8-26.000.

Daniel E. Gelles Associates, Inc.: *See—*
Beach, Wilma R., 281,211, Cl. D6-572.000.

Dearing, Timothy, to E. R. Howard Limited. Bottle or the like. 281,223, 11-5-85, Cl. D19-322.000.

Deflecto Corporation: *See—*
Meyer, Stephen T.; and Meyer, C. Rodger, 281,271, Cl. D23-149.000.

Dole, Charles M.: *See—*
Schosser, John F.; Gleason, Roger K.; Dole, Charles M.; Us, Max; and Burke, Bradley, 281,280, Cl. D26-46.000.

Doman, Donald W., to Kohler Co. Urinal. 281,270, 11-5-85, Cl. D23-68.000.

Duracell Inc.: *See—*
Schosser, John F.; Gleason, Roger K.; Dole, Charles M.; Us, Max; and Burke, Bradley, 281,280, Cl. D26-46.000.

E. R. Howard Limited: *See—*
Dearing, Timothy, 281,223, Cl. D19-322.000.

Eagle-Picher Industries, Inc.: *See—*
Armbruster, Joseph M., 281,207, Cl. D6-407.000.

Edmiston, Robert G. Hose bracket. 281,221, 11-5-85, Cl. D8-356.000.

Faidide, Christian, to S.A.R.L. Wichard. Snap hook. 281,222, 11-5-85, Cl. D8-367.000.

Farrer, Peter B., to Kemtron Properties Pty. Ltd. Portable fan. 281,276, 11-5-85, Cl. D23-155.000.

Felix, Gary; and Rivell, Thomas. Anemometric wind vane. 281,232, 11-5-85, Cl. D10-59.000.

Feuz, Timothy A. Rotatable chimney cowl. 281,275, 11-5-85, Cl. D23-154.000.

Fireman, Simon C., to Aqua-Leisure Industries, Inc. Mask and snorkel package. 281,224, 11-5-85, Cl. D9-337.000.

Firestone Tire & Rubber Company, The: *See—*
Hinrichsen, Silvana, 281,238, Cl. D12-147.000.

Fiskars Oy AB: *See—*
Johde, Reijo, 281,248, Cl. D15-29.000.

Gamefield Concept, Inc., The: *See—*
Irvine, Robert H.; and Gutkin, Peter, 281,268, Cl. D21-191.000.

Givler, Omar, to Portage Electric Products, Inc. Housing for a thermostatic switch. 281,240, 11-5-85, Cl. D13-34.000.

Glass Dimensions, Inc.: *See—*
Perkins, David R., 281,279, Cl. D26-10.000.

Glastar Corporation: *See—*
Best, Melvin H., 281,219, Cl. D8-98.000.

Gleason, Roger K.: *See—*
Schosser, John F.; Gleason, Roger K.; Dole, Charles M.; Us, Max; and Burke, Bradley, 281,280, Cl. D26-46.000.

Griffioen, Jan. Puppet. 281,265, 11-5-85, Cl. D21-153.000.

Grip, John A.: *See—*
Morgan, John H.; and Grip, John A., 281,228, Cl. D9-404.000.

Groetzner, Kurt; and Wurst, Bert, to Robert Bosch GmbH. Circuit board testing equipment. 281,233, 11-5-85, Cl. D10-75.000.

Groetzner, Kurt; and Wurst, Bert, to Robert Bosch GmbH. Circuit board testing equipment. 281,234, 11-5-85, Cl. D10-75.000.

Gutkin, Peter: *See—*
Irvine, Robert H.; and Gutkin, Peter, 281,268, Cl. D21-191.000.

Halsall, W. Norman. Flexible swing. 281,206, 11-5-85, Cl. D6-347.000.

Hamasaki, Benny T.: *See—*
Nall, Lawson H.; and Hamasaki, Benny T., 281,249, Cl. D15-129.000.

Health Enterprises, Inc.: *See—*
Leman, Arthur L., 281,225, Cl. D9-341.000.

Hensley, Heinz H., to Lillian Hensley Unternehmensberatungs GmbH. Game accessory holder. 281,259, 11-5-85, Cl. D21-54.000.

Hinrichsen, Silvana, to Firestone Tire & Rubber Company, The. Tire. 281,238, 11-5-85, Cl. D12-147.000.

Hirtle, Michael O.: *See—*
Volpe, Leo S.; and Hirtle, Michael O., 281,262, Cl. D21-108.000.
Volpe, Leo S.; and Hirtle, Michael O., 281,263, Cl. D21-108.000.

Hova, Mordechi. Telephone. 281,242, 11-5-85, Cl. D14-53.000.

Howard, Gale V. Sit-up exercise device. 281,267, 11-5-85, Cl. D21-191.000.

Independent Products Company, Inc.: *See—*
Rogahn, Gunther, 281,204, Cl. D6-328.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Bellini, Mario, 281,257, Cl. D18-22.000.

Insetta, Diane. Unicorn doll. 281,266, 11-5-85, Cl. D21-165.000.

International Business Machines: *See—*
Lenzi, Louis E., Jr., 281,246, Cl. D14-100.000.

International Business Machines Corporation: *See—*
Lahey, Donald F.; and Molerin, Dallas G., 281,247, Cl. D14-111.000.

Irvine, Robert H.; and Gutkin, Peter, to Gamefield Concept, Inc., The. Exercise bench. 281,268, 11-5-85, Cl. D21-191.000.

James, George E.: *See—*
James, Monica F.; and James, George E., 281,213, Cl. D7-81.000.

James, Monica F.; and James, George E. Cabinet for storing, measuring and dispensing food staples, such as coffee, sugar, flour, or the like. 281,213, 11-5-85, Cl. D7-81.000.

Johde, Reijo, to Fiskars Oy AB. Coil tine for a harrow. 281,248, 11-5-85, Cl. D15-29.000.

Johnson, David E.; Aebersold, Larry A.; and McCall, Kenneth E., to Arcair Company. Combined electrode drive and nozzle unit for an automatic air carbon-arc cutting and gouging torch. 281,250, 11-5-85, Cl. D15-144.000.

Kato, Shigemasa; and Takada, Sanae, to Tokyo Juki Industrial Co., Ltd. Electronic typewriter. 281,251, 11-5-85, Cl. D18-1.000.

Kato, Shigemasa; and Takada, Sanae, to Tokyo Juki Industrial Co., Ltd. Electronic typewriter. 281,252, 11-5-85, Cl. D18-1.000.

Kawachi, Manabu, to Pioneer Electronic Corporation. Loudspeaker. 281,241, 11-5-85, Cl. D14-30.000.

Kemtron Properties Pty. Ltd.: *See—*
Farrer, Peter B., 281,276, Cl. D23-155.000.

Kohler Co.: *See—*
Doman, Donald W., 281,270, Cl. D23-68.000.

Kondo, Hiroatsu: *See—*
Nibley, Richard; and Kondo, Hiroatsu, 281,255, Cl. D18-12.000.

Koon, Randy G.: *See—*
Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., 281,218, Cl. D8-67.000.

Lahey, Donald F.; and Molerin, Dallas G., to International Business Machines Corporation. Passbook printer. 281,247, 11-5-85, Cl. D14-111.000.

Lassiter, Will M. Trailer lock. 281,220, 11-5-85, Cl. D8-331.000.

Lastuck, Leonard V., to AMC Appliances, division of Algonquin Mercantile Corporation. Table top cooking grill. 281,215, 11-5-85, Cl. D7-363.000.

Laughon, Thomas C.: *See—*
Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., 281,218, Cl. D8-67.000.

Lazarus, Wayne P. Razor assembly or the like. 281,282, 11-5-85, Cl. D28-47.000.

Leman, Arthur L., to Health Enterprises, Inc. Pill box. 281,225, 11-5-85, Cl. D9-341.000.

Lenzi, Louis E., Jr., to International Business Machines. Keyboard. 281,246, 11-5-85, Cl. D14-100.000.

Leslie-Locke, Inc.: *See—*
Artwick, Kert E., 281,273, Cl. D23-151.000.

Lever Brothers Company: *See—*
Tyler, Frank S., 281,229, Cl. D9-425.000.

Lewis, Barbara K., to Qume Corporation. Computer housing. 281,245, 11-5-85, Cl. D14-100.000.

Lillian Hensley Unternehmensberatungs GmbH: *See—*
Hensley, Heinz H., 281,259, Cl. D21-54.000.

LoJacono, Francis X.: *See—*
Smith, Ronald R., 281,260, Cl. D21-66.000.

Lynch, Patrick E., Jr., to Pyramid Products, Inc. Vehicle air purifier. 281,272, 11-5-85, Cl. D23-149.000.

Manno, Joseph: *See—*
Blankenship, Larry K.; and Manno, Joseph, 281,278, Cl. D24-17.000.

Manufacture Metallurgique de Tournus, S.A.: *See—*
Schaller, Pierre A., 281,214, Cl. D7-356.000.

Matalon, Norma. Fragrance container. 281,281, 11-5-85, Cl. D28-5.000.

McCall, Kenneth E.: *See—*
Johnson, David E.; Aebersold, Larry A.; and McCall, Kenneth E., 281,250, Cl. D15-144.000.
Meyer, C. Rodger: *See—*
Meyer, Stephen T.; and Meyer, C. Rodger, 281,271, Cl. D23-149.000.
Meyer, Stephen T.; and Meyer, C. Rodger, to Deflecto Corporation. Lint trap. 281,271, 11-5-85, Cl. D23-149.000.
Molerin, Dallas G.: *See—*
Lahey, Donald F.; and Molerin, Dallas G., 281,247, Cl. D14-111.000.
Morgan, John H.; and Grip, John A., to American Cyanamid Co. Combined dispensing container and cap. 281,228, 11-5-85, Cl. D9-404.000.
Muller, Ronald L.; and Rakocy, William J., to North American Philips Corporation. Digital scale. 281,236, 11-5-85, Cl. D10-92.000.
Nall, Lawson H.; and Hamasaki, Benny T., to Tri Tool, Inc. Tube cutter. 281,249, 11-5-85, Cl. D15-129.000.
Nibley, Richard; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Ink ribbon cartridge for electronic typewriter. 281,255, 11-5-85, Cl. D18-12.000.
Norman S. Wright & Co.: *See—*
Wright, Norman S., Jr., 281,274, Cl. D23-153.000.
North American Philips Corporation: *See—*
Muller, Ronald L.; and Rakocy, William J., 281,236, Cl. D10-92.000.
Nottingham, John R.: *See—*
Spirk, John W., Jr.; and Nottingham, John R., 281,264, Cl. D21-130.000.
Nystrom, Susan T. Wall mounted valet. 281,203, 11-5-85, Cl. D6-324.000.
Ohtsu, Yutaka, to Citizen Watch Co., Ltd. Portable television set. 281,244, 11-5-85, Cl. D14-77.000.
Okano, Katsuhiko, to Ryobi Limited. Combined packaging and display container. 281,227, 11-5-85, Cl. D9-347.000.
Olson, David V.; and Bieger, Walter I. Household magnet for kitchen use. 281,230, 11-5-85, Cl. D9-434.000.
Perkins, David R., to Glass Dimensions, Inc. Combined oil lamp, vase or similar article. 281,279, 11-5-85, Cl. D26-10.000.
Pioneer Electronic Corporation: *See—*
Kawachi, Manabu, 281,241, Cl. D14-30.000.
Portage Electric Products, Inc.: *See—*
Givler, Omar, 281,240, Cl. D13-34.000.
Portavideo Entertainment Group, Inc.: *See—*
Thrush, Ted K., 281,200, Cl. D3-33.000.
Pyramid Products, Inc.: *See—*
Lynch, Patrick E., Jr., 281,272, Cl. D23-149.000.
Qume Corporation: *See—*
Lewis, Barbara K., 281,245, Cl. D14-100.000.
Raftery, William B., to Steelcase Inc. Table. 281,208, 11-5-85, Cl. D6-449.000.
Rakocy, William J.: *See—*
Muller, Ronald L.; and Rakocy, William J., 281,236, Cl. D10-92.000.
Reichenstein, Kenneth. Large button telephone. 281,243, 11-5-85, Cl. D14-53.000.
Reuter, Edward J., to Reuter, Inc. Refuse container. 281,284, 11-5-85, Cl. D34-5.000.
Reuter, Inc.: *See—*
Reuter, Edward J., 281,284, Cl. D34-5.000.
Ricoh Company, Ltd.: *See—*
Yamamoto, Toshio, 281,256, Cl. D18-13.000.
Rivell, Thomas: *See—*
Felix, Gary; and Rivell, Thomas, 281,232, Cl. D10-59.000.
Robert Bosch GmbH: *See—*
Groetzner, Kurt; and Wurst, Bert, 281,233, Cl. D10-75.000.
Groetzner, Kurt; and Wurst, Bert, 281,234, Cl. D10-75.000.
Roberts, Frank L., to Bio-Support Industries Ltd. Back rest. 281,210, 11-5-85, Cl. D6-502.000.
Rogahn, Gunther, to Independent Products Company, Inc. Anti-theft hanger ring. 281,204, 11-5-85, Cl. D6-328.000.
Ryobi Limited: *See—*
Okano, Katsuhiko, 281,227, Cl. D9-347.000.
S.A.R.L. Wichard: *See—*
Faidide, Christian, 281,222, Cl. D8-367.000.
Schaller, Pierre A., to Manufacture Metallurgique de Tournus, S.A. Stackable cookpot. 281,214, 11-5-85, Cl. D7-356.000.
Schiffmacher, William M., to Aspen Ribbons, Inc. Printer ribbon cartridge. 281,258, 11-5-85, Cl. D18-22.000.
Schimmel, Otto K., to Amba Marketing Systems, Inc. Handbag. 281,201, 11-5-85, Cl. D3-53.000.
Schosser, John F.; Gleason, Roger K.; Dole, Charles M.; Us, Max; and Burke, Bradley, to Duracell Inc. Compact light. 281,280, 11-5-85, Cl. D26-46.000.
SCM Corporation: *See—*
Christie, Cornelius W., 281,253, Cl. D18-1.000.
Sharp Corporation: *See—*
Akiyama, Kunio, 281,254, Cl. D18-4.000.
Singer Company, The: *See—*
Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., 281,218, Cl. D8-67.000.
Smith, Ronald R., to Weisenberg, Louis A.; and LoJacono, Francis X. Toy balance walker. 281,260, 11-5-85, Cl. D21-66.000.
Snyder, Kirk D. Fly swatter blade. 281,269, 11-5-85, Cl. D22-20.000.
Soehnle-Waagen GmbH & Co.: *See—*
Busse, Rido, 281,235, Cl. D10-91.000.
Spirk, John W., Jr.; and Nottingham, John R. Toy boat or similar article. 281,264, 11-5-85, Cl. D21-130.000.
Stachler, Thomas H. Tab opener for easy-open cans. 281,217, 11-5-85, Cl. D8-33.000.
Steelcase Inc.: *See—*
Raftery, William B., 281,208, Cl. D6-449.000.
Stevens, Julius J., to Teledyne Industries, Inc. Starter motor for an engine. 281,239, 11-5-85, Cl. D15-5.000.
Stubbmann, Albert. Inflatable riding toy. 281,261, 11-5-85, Cl. D21-74.000.
Takada, Sanae: *See—*
Kato, Shigemasa; and Takada, Sanae, 281,251, Cl. D18-1.000.
Kato, Shigemasa; and Takada, Sanae, 281,252, Cl. D18-1.000.
Teledyne Industries, Inc.: *See—*
Stevens, Julius J., 281,239, Cl. D15-5.000.
Thompson, Paul H. Toothbrush. 281,202, 11-5-85, Cl. D4-104.000.
3 Z Novelty Company, Inc.: *See—*
Zusman, Lawrence A., 281,237, Cl. D11-160.000.
Thrush, Ted K., to Portavideo Entertainment Group, Inc. Tamper-proof carrying case for a video cassette recorder. 281,200, 11-5-85, Cl. D3-33.000.
Timmers, Richard E. Auxiliary seat. 281,205, 11-5-85, Cl. D6-336.000.
Tokyo Juki Industrial Co., Ltd.: *See—*
Kato, Shigemasa; and Takada, Sanae, 281,251, Cl. D18-1.000.
Kato, Shigemasa; and Takada, Sanae, 281,252, Cl. D18-1.000.
Tri Tool, Inc.: *See—*
Nall, Lawson H.; and Hamasaki, Benny T., 281,249, Cl. D15-129.000.
Tyco Industries, Inc.: *See—*
Volpe, Leo S.; and Hirtle, Michael O., 281,262, Cl. D21-108.000.
Volpe, Leo S.; and Hirtle, Michael O., 281,263, Cl. D21-108.000.
Tyler, Frank S., to Lever Brothers Company. Packaging container. 281,229, 11-5-85, Cl. D9-425.000.
Us, Max: *See—*
Schosser, John F.; Gleason, Roger K.; Dole, Charles M.; Us, Max; and Burke, Bradley, 281,280, Cl. D26-46.000.
Vitalmetrics, Inc.: *See—*
Blankenship, Larry K.; and Manno, Joseph, 281,278, Cl. D24-17.000.
Volpe, Leo S.; and Hirtle, Michael O., to Tyco Industries, Inc. Toy building block. 281,262, 11-5-85, Cl. D21-108.000.
Volpe, Leo S.; and Hirtle, Michael O., to Tyco Industries, Inc. Toy building block. 281,263, 11-5-85, Cl. D21-108.000.
Weisenberg, Louis A.: *See—*
Smith, Ronald R., 281,260, Cl. D21-66.000.
Wimsatt, James M. Fan. 281,277, 11-5-85, Cl. D23-155.000.
Wright, Norman S., Jr., to Norman S. Wright & Co. Solar powered ventilator. 281,274, 11-5-85, Cl. D23-153.000.
Wurst, Bert: *See—*
Groetzner, Kurt; and Wurst, Bert, 281,233, Cl. D10-75.000.
Groetzner, Kurt; and Wurst, Bert, 281,234, Cl. D10-75.000.
Yamamoto, Toshio, to Ricoh Company, Ltd. Laser printer. 281,256, 11-5-85, Cl. D18-13.000.
Zusman, Lawrence A., to 3 Z Novelty Company, Inc. Novelty figurine. 281,237, 11-5-85, Cl. D11-160.000.

LIST OF PLANT PATENTEES

Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lontrelos. 5,580, 11-5-85, Cl. 71.000.

Ducloux, Yves: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,580, Cl. 71.000.

Jolly, Betty J.; and Jolly, Nelson F., to Jolly's Rosehill Farm of Kent, Inc. Rose plant 'Snow Bride'. 5,579, 11-5-85, Cl. 8.000.

Jolly, Nelson F.: *See*—
Jolly, Betty J.; and Jolly, Nelson F., 5,579, Cl. 8.000.

Jolly's Rosehill Farm of Kent, Inc.: *See*—
Jolly, Betty J.; and Jolly, Nelson F., 5,579, Cl. 8.000.

Laboratoire de Physiologie Vegetale de La Londe: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,580, Cl. 71.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 5TH DAY OF NOVEMBER, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Dellian, Kurt A. Apparatus for the electrolytic generation of alkali on both sides of a substrate. T106,001, 11-5-85, Cl. 204-212.000.

Mair, Alexander D.; and Soroczak, Myra M. Single float step phosphate ore beneficiation. T106,002, 11-5-85, Cl. 209-9.000.

Soroczak, Myra M.: *See*—
Mair, Alexander D.; and Soroczak, Myra M., T106,002, Cl. 209-9.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 5, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

181.6 4,550,445
239 4,550,446

CLASS 4

192 4,550,451
231 Re.32,017
319 4,550,452
323 4,550,453
420.4 4,550,454
480 4,550,455

CLASS 5

98 B 4,550,456
414 4,550,457
434 4,550,458
437 4,550,459

CLASS 7

164 4,550,460

CLASS 8

496 4,551,150
524 4,551,151

CLASS 12

1 R 4,550,461
17 R 4,550,462

CLASS 15

1.7 4,550,463
53 B 4,550,464
84 4,550,465
104.06 R 4,550,466
228 4,550,467
229 A 4,550,468
250.34 4,550,469

CLASS 16

85 4,550,470

CLASS 17

1 R 4,550,471
4,550,472
11 4,550,473

CLASS 24

633 4,550,474

CLASS 29

25.35 4,550,475
26 A 4,550,476
33.2 4,550,477
130 4,550,478
148.4 C 4,550,479
156.4 R 4,550,480
213 R 4,550,481
412 4,550,482
416 4,550,483
434 4,550,484
450 4,550,485
451 4,550,486
527.7 4,550,487
568 4,550,488
571 4,550,489
4,550,490
577 C 4,550,491
603 4,550,492
739 4,550,493
838 4,550,494

CLASS 30

120.3 4,550,495
124 4,550,496
169 4,550,497
276 4,550,498
4,550,499
392 4,550,500
393 4,550,501

CLASS 33

1 B 4,550,502
18 R 4,550,503
125 C 4,550,504
4,550,505
143 L 4,550,506
164 R 4,550,507
179.5 C 4,550,508

CLASS 34

133 4,550,509

CLASS 36

32 R 4,550,510
50 4,550,511

CLASS 37

117.5 4,550,512
141 R 4,550,513

CLASS 38

77.81 4,550,514

CLASS 40

362 4,550,515
513 4,550,516

CLASS 42

90 4,550,517

CLASS 43

2 4,550,518
15 4,550,519
21.2 4,550,520
41 4,550,521
55 4,550,522
61 4,550,523
75 4,550,524
131 4,550,525

CLASS 44

78 4,551,152

CLASS 47

1.5 4,550,526
58 4,550,527
4,550,528

CLASS 48

102 R 4,551,153
193 4,551,154
197 R 4,551,155

CLASS 49

348 4,550,529

CLASS 51

34 R 4,550,530
125 4,550,531
288 4,550,532

CLASS 52

2 4,550,533
19 4,550,534
60 4,550,535
91 4,550,536
103 4,550,537
169.7 4,550,538
236.1 4,550,539
309.4 4,550,540
309.7 4,550,543
309.8 4,550,541
476 4,550,542
741 4,550,544
799 4,550,545

CLASS 53

425 4,550,546
430 4,550,547
434 4,550,548
447 4,550,549
480 Re.32,018
529 4,550,550
534 4,550,551

CLASS 55

16 4,551,156
17 4,551,157
46 4,551,158

CLASS 56

13.9 4,550,552
202 4,550,553
294 4,550,554
314 4,550,555
341 4,550,556
4,550,557

CLASS 57

58.52 4,550,558
223 4,550,559
261 4,550,560

CLASS 60

39.02 4,550,561
4,550,562
39.06 4,550,563
39.093 4,550,564
39.182 4,550,565
554 4,550,566
562 4,550,567
612 4,550,568
657 4,550,569
693 4,550,570

CLASS 62

6 4,550,571
138 4,550,572
172 4,550,573
197 4,550,574
308 4,550,575
441 4,550,576
541 4,551,159

CLASS 65

2 4,551,160
4.2 4,551,162
27 4,551,161
129 4,551,163

CLASS 66

104 4,550,577

CLASS 68

5 C 4,550,579
5 E 4,550,578

CLASS 70

370 4,550,580
422 4,550,581

CLASS 71

6 4,551,164
24 4,551,165
30 4,551,166
64.1 4,551,167
90 4,551,168
94 4,551,169
4,551,170
121 4,551,171

CLASS 72

234 4,550,582
247 4,550,583
273 4,550,584
351 4,550,585
389 4,550,586
402 4,550,587
441 4,550,588

CLASS 73

11 4,550,589
19 4,550,590
28 4,550,591
37.5 4,550,592
40.7 4,550,593
61.1 C 4,550,594
116 4,550,595
117.3 4,550,596
118 4,550,597
146 4,550,598
151 4,550,599
299 4,550,600
304 R Re.32,019
382 R 4,550,601
428 4,550,602
587 4,550,603
4,550,604
622 4,550,605
626 4,550,606
4,550,607
633 4,550,608
642 4,550,609
702 4,550,610
708 4,550,611
727 4,550,612
834 4,550,613
861.19 4,550,614
861.21 4,550,615
861.74 4,550,616
862.04 4,550,617
862.34 4,550,618
862.62 4,550,619
864.55 4,550,620

CLASS 74

2 4,550,621
87 4,550,622
89.2 4,550,623
110 4,550,624
335 4,550,625
409 4,550,626
475 4,550,627
477 4,550,628
689 4,550,629
800 4,550,630
822 4,550,631

CLASS 75

11 4,551,172
12 4,551,173
4,551,174
513 4,551,175

CLASS 76

86 4,550,632

CLASS 81

56 4,550,633
418 4,550,634

CLASS 82

4 C 4,550,635

CLASS 83

743 4,550,636
783 Re.32,020

CLASS 84

386 4,550,637
431 4,550,638

CLASS 87

7 4,550,639

CLASS 89

1.806 4,550,640
12 4,550,641

CLASS 91

346 4,550,642
356 4,550,643
486 4,550,644
499 4,550,645

CLASS 92

128 4,550,646
157 4,550,647

CLASS 98

37 4,550,648
39.1 4,550,649
115.3 4,550,650

CLASS 99

279 4,550,651
4,550,652
348 4,550,653
4,550,654
450.4 4,550,655
590 4,550,656

CLASS 100

43 4,550,657
215 4,550,658

CLASS 101

93.04 4,550,659
128.21 4,550,660

CLASS 102

251 4,550,661
509 4,550,662

CLASS 104

119 4,550,663

CLASS 105

180 4,550,664
241.2 4,550,665

CLASS 106

90 4,551,176
210 4,551,177
273 N 4,551,178
277 4,551,179

CLASS 108

96 4,550,666

CLASS 109

70 4,550,667

CLASS 110

210 4,550,668
245 4,550,669

CLASS 112

121.11 4,550,670
235 4,550,671
293 4,550,672

CLASS 114

56 4,550,673
358 4,550,674

CLASS 116

28.1 4,550,675
206 4,550,676

CLASS 118

31 4,550,677
52 4,550,679
308 4,550,680
410 4,550,681
425 4,550,682
505 4,550,683
630 4,550,678
724 4,550,684

CLASS 119

71 4,550,685
102 4,550,686

CLASS 122

1 C 4,550,687
360 4,550,688
448 R 4,550,689
510 4,550,690

CLASS 123

3 4,550,691
41.02 4,550,694
41.1 4,550,692
4,550,693
41.12 4,550,695
73 D 4,550,696
149 D 4,550,697
195 AC 4,550,698
308 4,550,699
432 4,550,700
436 4,550,701
450 4,550,702
478 4,550,703
481 4,550,704
488 4,550,705
549 4,550,706
669 4,550,707

CLASS 125

15 4,550,708

CLASS 126

96 4,550,709
362 4,550,710
391 4,550,711
439 4,550,712

CLASS 128

1 R 4,550,713
1.5 4,550,714
4 4,550,715
6 4,550,716
16 4,550,717
20 Re.32,021
57 4,550,718
79 4,550,719
4,550,720
80 A 4,550,722
80 E 4,550,721
92 B 4,550,723
133 4,550,724
155 4,550,725
202.22 4,550,726
303.14 4,550,727
303.18 4,550,728
325 4,550,729
335.5 4,550,730
419 PG 4,550,732
419 PT 4,550,731
421 4,550,733
460 4,550,734
639 4,550,735
731 4,550,736
785 4,550,737

CLASS 131

236 4,550,738
247 4,550,739
336 4,550,740

CLASS 132

89 4,550,741

CLASS 134

9 4,551,180
22.11 4,551,181

CLASS 136

255 4,551,575

CLASS 137

14 4,550,742
68.1 4,550,743
80 4,550,744
99.5 4,550,745
461 4,550,746
487.5 4,550,747
605 4,550,748
843 4,550,749
868 4,550,750

CLASS 138

93 4,550,751

CLASS 139

435 4,550,752
4,550,753
452 4,550,754

CLASS 141

59 4,550,755

CLASS 148

12 C 4,551,182
12 R 4,551,183
127 4,551,184
150 4,551,185
171 4,551,186
411 4,551,187

CLASS 152

209 R 4,550,756
228 4,550,757

CLASS 156

73.5 4,551,189
159 4,551,190
276 4,551,191
345 4,551,192
423 4,551,193
441.5 4,551,188
468 4,551,194
603 4,551,195
616 R 4,551,196
642 4,551,197

CLASS 159

47.3 4,551,198

CLASS 160

176 R 4,550,759
271 4,550,758
328 4,550,760

CLASS 162

109 4,551,199
135 4,551,200
158 4,551,201
198 4,551,202
202 4,551,203
336 4,551,204
360.1 4,551,205

CLASS 164

14 4,550,761
98 4,550,762
119 4,550,763
122.2 4,550,764
194 4,550,765
428 4,550,766
4,550,767
456 4,550,768

CLASS 165

1 4,550,769
29 4,550,770
47 4,550,771
4,550,772
54 4,550,773
104.21 4,550,774
111 4,550,775
151 4,550,776
162 4,550,777

CLASS 166

234 4,550,778
248 4,550,779

323 4,550,780
340 4,550,781
382 4,550,782

CLASS 172

21 4,550,783

CLASS 173

114 4,550,784
134 4,550,785

CLASS 174

36 4,551,576
48 B1 4,099,020
57 4,551,577
88 R 4,551,579
182 4,551,578

CLASS 175

2 4,550,786
88 4,550,787
173 4,550,788
297 4,550,789
329 4,550,790
410 4,550,791

CLASS 177

25 4,550,792
145 4,550,793

CLASS 179

1.5 S 4,551,580
2 A 4,551,581
81 R 4,551,582
99 M 4,551,583
156 R 4,551,584
175.3 R 4,551,585

CLASS 180

219 4,550,794
296 4,550,795

CLASS 181

141 4,550,796
167 4,550,797
201 4,550,798
244 4,550,799

CLASS 182

3 4,550,800
7 4,550,801
113 4,550,802
129 4,550,803
233 4,550,804

CLASS 184

18 4,550,805

CLASS 187

10 4,550,806
4,550,807

CLASS 188

1.12 4,550,808
18 A 4,550,809
71.4 4,550,810
170 4,550,811
379 4,550,812

CLASS 190

18 A 4,550,813

CLASS 192

0.052 4,550,816
18 B 4,550,814
30 W 4,550,815
70.23 4,550,817

CLASS 194

1 D 4,550,818
1 N 4,550,819

CLASS 198

389 4,550,820
416 4,550,821
461 4,550,822
805 4,550,823

CLASS 200

5 A 4,551,586
11 R 4,551,587
33 R 4,551,588
38 A 4,551,589
38 R 4,551,590
61.13 4,551,591
67 D 4,551,592
81 R 4,551,593
82 R 4,551,594
86 R 4,551,595
144 B 4,551,596
249 4,551,597
314 4,551,598

CLASS 202

99 4,551,206

CLASS 203

56 4,551,207
60 4,551,208

CLASS 204

1 T 4,551,209
28 4,551,210
37.6 4,551,211
52 R 4,551,212
111 4,551,213
159 4,551,214
159.23 4,551,215
192 C 4,551,216
206 B1 3,928,163
212 4,551,217
240 4,551,218
290 R 4,551,219
294 4,551,220
298 4,551,221
417 4,551,222

CLASS 206

150 4,550,824
222 4,550,825
259 4,550,826
304 4,550,827
349 4,550,828
361 4,550,829
386 4,550,830
439 4,550,831
509 4,550,832
527 4,550,833
611 4,550,834

CLASS 208

8 R 4,551,223
10 4,551,224
43 4,551,225
48 AA 4,551,226
4,551,227
65 4,551,228
76 4,551,229
89 4,551,230
92 4,551,232
100 4,551,235
106 4,551,233
112 4,551,236
120 4,551,231
179 4,551,234
188 4,551,239
251 R 4,551,237
340 4,551,238

CLASS 209

143 4,551,240
148 4,551,241
211 4,551,242

CLASS 210

180 4,551,243
198.1 4,551,244
198.2 4,551,245
4,551,249
221.2 4,551,246
304 4,551,247
404 4,551,248
603 4,551,250
635 4,551,251
638 4,551,252
680 4,551,253
688 4,551,254
770 4,551,255

CLASS 211

24 4,550,835
41 4,550,836
126 4,550,837
128 4,550,838
189 4,550,839
197 4,550,840

CLASS 215

211 4,550,841
232 4,550,842
252 4,550,843
4,550,844
4,550,845
296 4,550,846

CLASS 219

10.49 R 4,551,600
10.55 B 4,551,601
69 D 4,551,602
76.13 4,551,603
78.12 4,551,604
86.31 4,551,605
121 EA 4,551,606
121 L 4,551,608
121 LJ 4,551,607
121 PR 4,551,609
146.3 4,551,610
308 4,551,611
312 4,551,612
316 4,551,613
355 4,551,614
373 4,551,615
460 4,551,616
464 4,551,617
510 4,551,618
523 4,551,619

CLASS 220

4 F 4,550,847
22 4,550,848
71 4,550,849
253 4,550,850
277 4,550,851
327 4,550,852
416 4,550,853
468 4,550,854

CLASS 221

63 4,550,855
4,550,856
70 4,550,857

CLASS 222

1 4,550,858
26 4,550,859
78 4,550,861
109 4,550,862
145 4,550,863
209 4,550,864
402.21 4,550,865
420 4,550,866
607 4,550,867
615 4,550,860

CLASS 223

43 4,550,868

CLASS 224

202 4,550,869

CLASS 227

19 4,550,870

CLASS 228

4.5 4,550,871
48 4,550,872

CLASS 229

30 4,550,873

CLASS 235

1 C 4,551,620
117 R 4,551,621

CLASS 236

1 G 4,550,874

CLASS 239

88 4,550,875
211 4,550,876
265.35 4,550,877
542 4,550,878

CLASS 241

52 4,550,879

CLASS 242

18 DD 4,550,880
35.6 E 4,550,886
56 R 4,550,881
56.3 4,550,887
56.6 4,550,882
59 4,550,883
189 4,550,884
204 4,550,885

CLASS 244

3.22 4,550,888

CLASS 246

28 R 4,550,889

CLASS 248

59 4,550,890
68.1 4,550,891
90 4,550,892
222.4 4,550,893
346 4,550,894

CLASS 250

211 R 4,551,622
4,551,623
287 4,551,624
310 4,551,625
327.2 4,551,626
339 4,551,627
396 R 4,551,599
503.1 4,551,628
578 4,551,629

CLASS 251

1.3 4,550,895
84 4,550,896

CLASS 252

8.5 LC 4,551,256
32.7 E 4,551,257
4,551,258
48.2 4,551,259
62.59 4,551,260
88 4,551,261
181 4,551,262
186.39 4,551,263
299.62 4,551,264
301.17 4,551,265
400 R 4,551,266

511 4,551,267
519 4,551,268
520 4,551,269

CLASS 254

93 R 4,550,897

CLASS 260

112 R 4,551,271
112.5 E 4,551,273
112.5 R 4,551,270
4,551,272
123.5 4,551,274
239 A 4,551,276
4,551,277
239 D 4,551,275
397.4 4,551,278
404 4,551,279
465 D 4,551,280
4,551,281
501.18 4,551,282
508 4,551,283

CLASS 261

44 B 4,551,284
87 4,551,285

CLASS 264

1.9 4,551,286
4.6 4,551,288
23 4,551,289
46.6 4,551,290
104 4,551,291
139 4,551,292
150 4,551,293
175 4,551,294
177 F 4,551,296
177 R 4,551,295
224 4,551,297

CLASS 266

220 4,550,898

CLASS 267

119 4,550,899

CLASS 269

3 R 4,551,287
87 4,550,900
328 4,550,901

CLASS 271

10 4,550,902
98 4,550,903
198 4,550,904
202 4,550,905

CLASS 272

73 4,550,906
93 4,550,907
130 4,550,908

CLASS 273

73 G 4,550,909
86 B 4,550,910
94 4,550,911
113 4,550,912
126 R 4,550,913
183 D 4,550,914
239 4,550,916
246 4,550,917
272 4,550,915
385 4,550,918

CLASS 277

23 4,550,919
134 4,550,920
167.5 4,550,921

CLASS 279

119 4,550,922

CLASS 280

5 A 4,550,923
5.28 4,550,924
47.13 B 4,550,925
112 A 4,550,926
281 R 4,550,927
421 4,550,928
614 4,550,929
655 4,550,930
4,550,931
689 4,550,932
808 4,550,933

CLASS 283

37 4,550,934

CLASS 285

18 4,550,935
26 4,550,936
334 4,550,937

CLASS 289

1.2 4,550,938

CLASS 290

38 R 4,551,630
55 4,551,631

CLASS 292

340 4,550,939

CLASS 294

54.5 4,550,943
67.4 4,550,940
86.4 4,550,941
102.2 4,550,942

CLASS 296

70 4,550,944
100 4,550,945
156 4,550,946
181 4,550,947
202 4,550,948

CLASS 297

284 4,550,949
440 4,550,950
480 4,550,951

CLASS 299

64 4,550,952

CLASS 303

15 4,550,953
92 4,550,954

CLASS 307

9 4,551,632
141 B1 4,370,566
147 4,551,633
243 4,551,634
254 4,551,635
264 4,551,636
308 4,551,637
455 4,551,638
4,551,639
471 4,551,640
530 4,551,641
552 4,551,642
570 4,551,643
573 4,551,644

CLASS 308

6 C 4,550,955

CLASS 310

46 4,551,645
242 4,551,646
335 4,551,647

CLASS 312

250 4,550,956

CLASS 313

37 4,551,648
336 4,551,649
362.1 4,551,650
402 4,551,651
466 4,551,652

CLASS 315

10 4,551,653
159 4,551,654
370 4,551,655
392 4,551,656
399 4,551,657

CLASS 318

254 4,551,658
258 4,551,659
293 4,551,660
314 4,551,661
316 4,551,662
482 4,551,663
592 4,551,664
696 4,551,665

CLASS 320

20 4,551,666
46 4,551,667

CLASS 323

234 4,551,668
268 4,551,669
281 4,551,670

CLASS 324

51 4,551,671
133 4,551,672
158 F Re.32,024
4,551,673
4,551,675
158 R 4,551,674
208 4,551,676
226 4,551,677
300 4,551,678
309 4,551,679
4,551,680
333 4,551,681

CLASS 328

22 4,551,682
167 4,551,683

CLASS 330

4.3 4,551,684
86 4,551,685
100 4,551,686
258 4,551,687
280 4,551,688

CLASS 331

2 4,551,689
36 L 4,551,690
111 4,551,691

CLASS 333

21 A 4,551,692
22 R 4,551,693
24 C 4,551,694
195 4,551,695
204 4,551,696

CLASS 335

16 4,551,697
78 4,551,698

CLASS 336

135 4,551,699
192 4,551,700

CLASS 337

97 4,551,701
347 4,551,702

CLASS 339

5 R 4,550,957
4,550,958
9 E 4,550,959
14 R 4,550,960
4,550,961
17 LC 4,550,962
31 R 4,550,963
44 M 4,550,964
47 R 4,550,965
84 4,550,966
88 R 4,550,967
91 R 4,550,968
97 P 4,550,970
98 4,550,969
99 R 4,550,971
256 R 4,550,972

CLASS 340

52 D 4,551,703
287 4,551,707
347 AD 4,551,704
347 DA 4,551,705
4,551,709
347 DD 4,551,706
347 SY 4,551,708
505 4,551,710
567 4,551,711
572 4,551,712
666 4,551,713
671 4,551,715
711 4,551,716
712 4,551,717
825.16 4,551,718
825.36 4,551,719
825.52 4,551,720
4,551,721
825.72 4,551,714
904 4,551,722
946 4,551,723

CLASS 343

5 CM 4,551,724
6.5 SS 4,551,725
18 C 4,551,726
418 4,551,727
761 4,551,728

CLASS 346

1.1 4,551,729
33 WL 4,551,730
75 4,551,731
110 R 4,551,732
137 4,551,733
140 R 4,551,734
4,551,735
4,551,736
161 4,551,737
200 4,551,738
216 4,551,739
218 4,551,740

CLASS 350

3.72 4,550,973
6.3 4,550,985
96.15 4,550,974
96.18 4,550,975
96.23 4,550,976
128 4,550,977
138 4,550,978
321 4,550,979
349 4,550,980
350 R 4,550,981
357 4,550,982
376 4,550,983
404 4,550,984
454 4,550,987

584 4,550,988
641 4,550,986

CLASS 351

103 4,550,989
243 4,550,990

CLASS 354

21 4,550,991
173.11 4,550,992
402 4,550,993
4,550,994
403 4,550,995
416 4,550,996
459 4,550,997

CLASS 355

3 BE 4,551,001
3 DD 4,550,998
4,551,002
4,551,004
3 R 4,551,000
4,551,003
3 TR 4,550,999
8 4,551,005
14 E 4,551,008
14 FU 4,551,006
4,551,007
15 4,551,009
25 4,551,010
35 4,551,011
50 4,551,012
55 4,551,013
75 4,551,014
4,551,015
91 4,551,016

CLASS 356

28.5 4,551,017
4,551,018
73.1 4,551,019
4,551,020
307 Re.32,022
350 4,551,021
406 4,551,022
444 4,551,023

CLASS 357

23.6 4,551,741
31 4,551,742
50 4,551,743
64 4,551,744
72 4,551,745
74 4,551,746
4,551,747

CLASS 358

10 4,551,748
28 4,551,749
75 4,551,750
4,551,751
113 4,551,752
140 4,551,753
180 4,551,754
188 4,551,755
197 4,551,756
212 4,551,757
213 4,551,758
4,551,759
4,551,760
4,551,761
221 4,551,762
225 4,551,763
228 4,551,764
248 4,551,765
256 4,551,766
257 4,551,767
283 4,551,768
296 4,551,769
342 4,551,770

CLASS 360

19.1 4,551,771
40 4,551,773
46 4,551,772
72.1 4,551,774
74.1 4,551,775
77 4,551,776
4,551,777
131 4,551,778

CLASS 361

86 4,551,779
113 4,551,780
143 4,551,781
151 4,551,782
223 4,551,783
225 4,551,784
284 4,551,785
306 4,551,786
387 4,551,787
403 4,551,788
406 4,551,789

CLASS 362

23 4,551,790
296 4,551,791
362 4,551,792
370 4,551,793
392 4,551,794

CLASS 364

139 4,551,795
148 4,551,796
200 4,551,797
4,551,798
4,551,799
414 4,551,800
424 4,551,801
424.1 4,551,802
431.05 4,551,803
434 4,551,804
469 4,551,805
473 4,551,806
4,551,807
474 4,551,808
4,551,809
475 4,551,810
481 4,551,811
492 4,551,812
569 4,551,813
716 4,551,814
4,551,815
724 4,551,816
811 4,551,817
900 4,551,818

CLASS 365

120 4,551,819
189 4,551,820
203 4,551,821
222 4,551,822

CLASS 366

40 4,551,024
144 4,551,025
149 4,551,026

CLASS 367

35 4,551,823
76 4,551,824
101 4,551,825
150 4,551,826

CLASS 368

15 4,551,027
204 4,551,028
273 4,551,029

CLASS 369

101 4,551,827
275 4,551,828

CLASS 370

3 4,551,829
15 4,551,830
58 4,551,831
4,551,832
60 4,551,833
94 4,551,834
110.1 4,551,835

CLASS 371

1 4,551,836
25 4,551,837
4,551,838
35 4,551,839
38 4,551,840
66 4,551,841
69 4,551,842

CLASS 372

87 4,551,843

CLASS 373

12 4,551,844

CLASS 374

5 4,551,030
117 4,551,031

CLASS 375

40 4,551,845
82 4,551,846

CLASS 376

245 4,551,298
261 4,551,299
364 4,551,300

CLASS 377

24 4,551,847

CLASS 378

045 4,551,848

CLASS 381

86 4,551,849

CLASS 382

18 4,551,850
38 4,551,851

CLASS 384

517 4,551,032

CLASS 400

308 4,551,033

CLASS 401

104 4,551,034
4,551,035
131 4,551,036
146 4,551,037
265 4,551,038

CLASS 402

60 4,551,039

CLASS 406

28 4,551,040
85 4,551,041
93 4,551,042

CLASS 407

43 4,551,043

CLASS 408

185 4,551,044
206 4,551,045

CLASS 409

82 4,551,046
182 4,551,047
197 4,551,048

CLASS 410

42 4,551,049

CLASS 411

436 4,551,050

CLASS 414

21 4,551,051
81 4,551,052
114 4,551,053
229 4,551,054
293 4,551,055
420 4,551,057
459 4,551,059
539 4,551,056
541 4,551,060
735 4,551,058
4,551,061

CLASS 415

115 4,551,062
4,551,063
116 4,551,064
219 R 4,551,065

CLASS 416

119 4,551,066
140 4,551,067

CLASS 417

8 4,551,068
13 4,551,069
68 4,551,070
313 4,551,071
318 4,551,072
352 4,551,073
366 4,551,074
383 4,551,075
395 4,551,076
454 4,551,077

CLASS 418

16 4,551,078
26 4,551,079
28 4,551,080
55 4,551,081
4,551,082
61 A 4,551,083

CLASS 419

21 4,551,301

CLASS 420

464 4,551,302
590 4,551,303

CLASS 422

4 4,551,304
5 4,551,305
56 4,551,306
4,551,307
58 4,551,308
135 4,551,309
186.05 4,551,310
300 4,551,311

CLASS 423

53 4,551,312
54 4,551,314
59 4,551,313
67 4,551,315
265 4,551,318
290 4,551,316
300 4,551,317
316 4,551,319
321 R 4,551,320
329 4,551,321
4,551,322
387 4,551,323
4,551,324
488 4,551,325
594 4,551,326
4,551,327
607 4,551,328

CLASS 424

22 4,551,329
59 4,551,330
195.1 4,551,331
4,551,332

CLASS 425

185 4,551,084
405 R 4,551,085
425 4,551,086
466 4,551,087

CLASS 426

1 4,551,333
26 4,551,334
44 4,551,335
83 4,551,336
94 4,551,337
281 4,551,338
384 4,551,339
437 4,551,340
489 4,551,341
548 4,551,342
549 4,551,343
594 4,551,344
4,551,345
602 4,551,346
621 4,551,347
639 4,551,348
656 4,551,351

CLASS 427

39 4,551,352
4,551,353
46 4,551,354
48 4,551,355
64 4,551,356
96 4,551,357
126.6 4,551,358
130 4,551,359
160 4,551,360
164 4,551,361
180 4,551,362
255.6 4,551,349
389.9 4,551,350

CLASS 428

28 4,551,363
34 4,551,364
35 4,551,365
4,551,366
4,551,367
4,551,368
36 4,551,369
4,551,370
4,551,371
38 4,551,372
43 4,551,373
4,551,374
57 4,551,375
85 4,551,376
137 4,551,377
198 4,551,378
200 4,551,379
218 4,551,380
240 4,551,381
258 4,551,382
286 4,551,383
312.6 4,551,384
323 4,551,385
4,551,386
336 4,551,387
355 4,551,388
383 4,551,398
402 4,551,389
431 4,551,390
462 4,551,391
495 4,551,392
609 4,551,393
641 4,551,394
677 4,551,395
678 4,551,396
691 4,551,397

CLASS 429

27 4,551,399
94 4,551,400
122 4,551,401
254 4,551,402

CLASS 430

58 4,551,403
59 4,551,404
64 4,551,405
119 4,551,406
138 4,551,407
141 4,551,408
192 4,551,409
215 4,551,410
216 4,551,411
265 4,551,412
270 4,551,413
4,551,414
281 4,551,415
311 4,551,416
316 4,551,417
325 4,551,418
445 4,551,419
505 4,551,420
509 4,551,421
551 4,551,422
559 4,551,423
588 4,551,424

CLASS 431

76 4,551,088
116 4,551,089
188 4,551,090

CLASS 432

23 4,551,091
32 4,551,092
59 4,551,093

CLASS 433

8 4,551,094
19 4,551,095
24 4,551,096
39 4,551,097
90 B1 4,330,280
171 4,551,098
212.1 4,551,099
218 4,551,100

CLASS 434

55 4,551,101
114 4,551,102
225 4,551,103

CLASS 435

4 4,551,425
7 4,551,426
14 4,551,427
19 4,551,428
68 4,551,429
94 4,551,430
176 4,551,431
232 4,551,432
253 4,551,433

CLASS 436

5 4,551,434
541 4,551,435

CLASS 440

56 4,551,104
61 4,551,105

CLASS 441

94 4,551,106
112 Re.32,023
4,551,107
116 4,551,108

CLASS 446

95 4,551,109
118 4,551,110
120 4,551,111
154 4,551,113
207 4,551,112
397 4,551,114

CLASS 455

33 4,551,852
72 4,551,853
78 4,551,854
161 4,551,855
183 4,551,856

CLASS 464

83 4,551,115
97 4,551,116
106 4,551,117
182 4,551,118

CLASS 474

28 4,551,119
135 4,551,120
140 4,551,121
170 4,551,122

CLASS 493

108 4,551,123
128 4,551,124
217 4,551,125
453 4,551,126
462 4,551,127

CLASS 501

90 4,551,436

CLASS 502

5 4,551,437
62 4,551,438
107 4,551,439
119 4,551,440
159 4,551,441
178 4,551,442
313 4,551,443
4,551,444

CLASS 514

9 4,551,445
77 4,551,446
94 4,551,447
130 4,551,448
182 4,551,449
183 4,551,450
217 4,551,451
222 4,551,452
234 4,551,453
252 4,551,454
4,551,455
254 4,551,456
258 4,551,457
259 4,551,458
267 4,551,459
4,551,460
275 4,551,461
283 4,551,462
300 4,551,463
305 4,551,473
309 4,551,474
312 4,551,464
317 4,551,465
318 4,551,466
334 4,551,467
339 4,551,468
383 4,551,469
408 4,551,475
413 4,551,470
419 4,551,471
461 4,551,476
477 4,551,472
547 4,551,477
603 4,551,478
657 4,551,479
680 4,551,480

CLASS 521

52 4,551,481
53 4,551,482
103 4,551,483

CLASS 523

169 4,551,484
212 4,551,485
4,551,486
215 4,551,487
427 4,551,488
501 4,551,489

CLASS 524

22 4,551,490
31 4,551,491
40 4,551,492
89 4,551,493
4,551,494
94 4,551,495
322 4,551,496
423 4,551,497
424 4,551,498
487 4,551,499

CLASS 525

71 4,551,500
88 4,551,501
326.9 4,551,502
332.1 4,551,503
333.9 4,551,504
346 4,551,505
417 4,551,506
437 4,551,507
507 4,551,508

CLASS 526

68 4,551,509
4,551,510
204 4,551,511
264 4,551,512
307.1 4,551,513
348.1 4,551,514

CLASS 528

18 4,551,515
4,551,516
60 4,551,517
80 4,551,518
296 4,551,519
302 4,551,520
4,551,521
351 4,551,522

CLASS 536

119 4,551,523
121 4,551,524

CLASS 544

49 4,551,525
163 4,551,526
214 4,551,527
242 4,551,528
265 4,551,529
281 4,551,530
320 4,551,531

CLASSIFICATION OF PATENTS

CLASS 546	
22	4,551,532
35	4,551,533
121	4,551,535
123	4,551,534
264	4,551,536
330	4,551,537
CLASS 548	
367	4,551,538
412	4,551,539
531	4,551,540
CLASS 549	
215	4,551,541
401	4,551,542
CLASS 556	
14	4,551,543
40	4,551,544
CLASS 560	
124	4,551,545
	4,551,546
255	4,551,547
CLASS 562	
402	4,551,548
437	4,551,549
CLASS 564	
215	4,551,550
430	4,551,551
448	4,551,552
CLASS 568	
311	4,551,553
322	4,551,554
401	4,551,555
403	4,551,556
433	4,551,557
	4,551,558
454	4,551,559
465	4,551,560
619	4,551,561
771	4,551,562
804	4,551,563
834	4,551,564
864	4,551,565
867	4,551,566
907	4,551,567
939	4,551,568
CLASS 585	
6.6	4,551,569
355	4,551,570
440	4,551,571
454	4,551,572
459	4,551,573
660	4,551,574
CLASS 604	
9	4,551,128
21	4,551,129
31	4,551,131
32	4,551,130
52	4,551,132
66	4,551,133
	B1 4,275,727
67	4,551,134
82	4,551,135
141	4,551,136
171	4,551,137
262	4,551,138
	4,551,140
290	4,551,139
317	4,551,141
368	4,551,142
371	4,551,143
378	4,551,144
389	4,551,145
403	4,551,146
405	4,551,147
890	4,551,148
CLASS 623	
1	4,550,447
4	4,551,149
16	4,550,448
	4,550,449
18	4,550,450

CLASSIFICATION OF DESIGNS

D3—	33	281,200		363	281,215		434	281,230		100	281,245			281,258		149	281,271
	53	281,201	D8—	26	281,216		456	281,231			281,246	D19—	322	281,223			281,272
D4—	104	281,202		33	281,217	D10—	59	281,232		111	281,247	D21—	54	281,259		151	281,273
D6—	324	281,203		67	281,218		75	281,233	D15—	5	281,239		66	281,260		153	281,274
	328	281,204		98	281,219			281,234		29	281,248		74	281,261		154	281,275
	336	281,205		331	281,220		91	281,235		129	281,249		108	281,262		155	281,276
	347	281,206		356	281,221		92	281,236		144	281,250			281,263			281,277
	407	281,207		367	281,222	D11—	160	281,237	D18—	1	281,251		130	281,264	D24—	17	281,278
	449	281,208	D9—	337	281,224	D12—	147	281,238			281,252		153	281,265	D26—	10	281,279
	468	281,209		341	281,225	D13—	34	281,240			281,253		165	281,266		46	281,280
	502	281,210			281,226	D14—	30	281,241		4	281,254		191	281,267	D28—	5	281,281
	572	281,211					53	281,242		12	281,255			281,268		47	281,282
D7—	46	281,212		347	281,227			281,243		13	281,256	D22—	20	281,269	D30—	1	281,283
	81	281,213		404	281,228		77	281,244		22	281,257	D23—	68	281,270	D34—	5	281,284
	356	281,214		425	281,229												

CLASSIFICATION OF PLANTS

P.—	8	5,579		71	5,580									

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

204—	212	T106,001	209—	9	T106,002									

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,550,519	4,550,908	4,551,708	12 : Re.32,022	4,550,869	4,551,630
	4,550,788	4,550,910	4,551,720	4,550,458	4,550,876	4,370,566
	4,551,677	4,550,911	4,551,724	4,550,521	4,550,896	19 : 4,550,645
04 :	4,550,522	4,550,914	4,551,730	4,550,600	4,550,902	4,551,603
	4,550,807	4,550,918	4,551,759	4,550,602	4,550,917	4,551,688
	4,550,818	4,550,921	4,551,788	4,550,640	4,550,928	4,551,713
	4,550,848	4,550,936	4,551,797	4,550,706	4,551,076	20 : 4,550,708
	4,550,912	4,550,940	4,551,814	4,550,719	4,551,084	4,550,856
	4,551,213	4,550,950	4,551,815	4,550,727	4,551,105	4,550,934
	4,551,312	4,550,951	4,551,816	4,550,731	4,551,109	4,551,217
	4,551,721	4,550,983	4,551,828	4,550,732	4,551,112	21 : 4,550,553
	4,551,727	4,550,999	08 : 4,550,455	4,550,738	4,551,134	4,550,625
	4,551,799	4,551,034	4,550,801	4,550,849	4,551,143	4,550,740
	4,551,804	4,551,045	4,550,805	4,550,866	4,551,235	4,551,231
	4,551,812	4,551,061	4,550,884	4,550,913	4,551,261	4,551,234
	4,551,836	4,551,066	4,551,313	4,551,164	4,551,279	4,551,589
	4,551,837	4,551,127	4,551,314	4,551,246	4,551,330	4,551,618
05 :	4,551,332	4,551,131	4,551,681	4,551,326	4,551,354	22 : 4,550,450
06 :	Re.32,023	4,551,133	4,551,687	4,551,329	4,551,370	4,551,068
	4,550,447	4,551,146	4,551,719	4,551,480	4,551,430	4,551,317
	4,550,451	4,551,153	4,551,772	4,551,570	4,551,432	4,551,461
	4,550,453	4,551,155	4,551,847	4,551,619	4,551,526	4,551,485
	4,550,461	4,551,167	09 : 4,550,497	4,551,685	4,551,527	23 : 4,550,537
	4,550,481	4,551,170	4,550,564	4,551,728	4,551,537	4,550,855
	4,550,482	4,551,199	4,550,573	4,551,829	4,551,551	4,551,507
	4,550,492	4,551,206	4,550,668	4,551,856	4,551,572	24 : 4,550,501
	4,550,499	4,551,226	4,550,694	13 : 4,550,473	4,551,574	4,550,601
	4,550,513	4,551,229	4,550,702	4,550,550	4,551,581	4,551,092
	4,550,523	4,551,237	4,550,812	4,550,583	4,551,585	4,551,251
	4,550,539	4,551,249	4,550,864	4,550,624	4,551,586	4,551,624
	4,550,544	4,551,255	4,550,964	4,550,642	4,551,590	4,551,697
	4,550,547	4,551,275	4,550,968	4,550,657	4,551,598	4,551,835
	4,550,589	4,551,285	4,550,973	4,550,877	4,551,607	25 : 4,550,452
	4,550,607	4,551,290	4,551,070	16 : 4,550,623	4,551,670	4,550,571
	4,550,608	4,551,291	4,551,145	17 : 4,550,456	4,551,696	4,550,639
	4,550,634	4,551,315	4,551,163	4,550,471	4,551,714	4,550,674
	4,550,636	4,551,325	4,551,189	4,550,496	4,551,801	4,550,715
	4,550,651	4,551,433	4,551,210	4,550,515	4,551,833	4,550,769
	4,550,684	4,551,438	4,551,248	4,550,518	18 : 4,550,474	4,550,798
	4,550,690	4,551,447	4,551,452	4,550,556	4,550,524	4,550,828
	4,550,741	4,551,449	4,551,483	4,550,595	4,550,546	4,551,028
	4,550,747	4,551,459	4,551,539	4,550,611	4,550,576	4,551,162
	4,550,784	4,551,487	4,551,540	4,550,616	4,550,581	4,551,197
	4,550,792	4,551,604	4,551,542	4,550,626	4,550,692	4,551,241
	4,550,799	4,551,628	4,551,690	4,550,643	4,550,850	4,551,353
	4,550,800	4,551,629	4,551,692	4,550,656	4,550,874	4,551,365
	4,550,808	4,551,638	4,551,796	4,550,678	4,551,094	4,551,385
	4,550,851	4,551,647	4,551,806	4,550,710	4,551,096	4,551,409
	4,550,857	4,551,649	4,551,832	4,550,762	4,551,137	4,551,699
	4,550,870	4,551,664	10 : 4,550,834	4,550,837	4,551,243	4,551,773
	4,550,888	4,551,680	4,551,426	4,550,838	4,551,306	4,551,783
	4,550,895	4,551,684	4,551,552	4,550,840	4,551,342	4,551,825
	4,550,906	4,551,705	4,330,280	4,550,867	4,551,398	26 : 4,550,467

4,550,529
4,550,535
4,550,551
4,550,563
4,550,574
4,550,575
4,550,592
4,550,597
4,550,627
4,550,628
4,550,675
4,550,682
4,550,739
4,550,770
4,550,772
4,550,817
4,550,830
4,550,875
4,550,893
4,550,899
4,550,939
4,550,944
4,551,016
4,551,024
4,551,032
4,551,048
4,551,085
4,551,103
4,551,115
4,551,118
4,551,350
4,551,395
4,551,400
4,551,470
4,551,491
4,551,502
4,551,529
4,551,577
4,551,663
4,551,672
4,551,802
4,551,808
27 : 4,550,555
4,550,648
4,550,758
4,550,773
4,550,807
4,550,919
4,550,957
4,550,958
4,550,969
4,550,988
4,551,021
4,551,036
4,551,083
4,551,141
4,551,144
4,551,292
4,551,337
4,551,355
4,551,374
4,551,378
4,551,394
4,551,473
4,551,746
4,551,747
4,551,850
29 : 4,550,503
4,550,511
4,550,520
4,550,619
4,550,819
4,550,901
4,550,915
4,551,139
4,551,148
4,551,274
4,551,633
30 : 4,550,512
4,551,095
4,551,207
4,551,718
31 : 4,550,783
4,550,860
4,550,904
4,551,185
4,551,544
4,551,667
4,551,707
32 : 4,550,787
4,550,892
33 : 4,550,760
4,550,785
4,550,861
34 : 4,550,448
4,550,449
4,550,502
4,550,714
4,550,729
4,550,730
4,550,733
4,550,813
4,550,829
4,550,846
4,550,859
4,550,894
4,550,907
4,550,945
4,550,965
4,551,059
4,551,080
4,551,093
4,551,097
4,551,099
4,551,142
4,551,171
4,551,177
4,551,209
4,551,212
4,551,228
4,551,238
4,551,245
4,551,257
4,551,259
4,551,266
4,551,276
4,551,288
4,551,296
4,551,308
4,551,320
4,551,323
4,551,324
4,551,344
4,551,345
4,551,347
4,551,352
4,551,415
4,551,416
4,551,460
4,551,463
4,551,474
4,551,481
4,551,490
4,551,504
4,551,514
4,551,519
4,551,522
4,551,533
4,551,536
4,551,543
4,551,560
4,551,576
4,551,580
4,551,643
4,551,648
4,551,654
4,551,674
4,551,760
4,551,762
4,551,765
4,551,770
4,551,782
4,551,838
4,099,020
35 : 4,551,763
4,551,844
36 : Re.32,024
4,550,446
4,550,485
4,550,489
4,550,493
4,550,528
4,550,533
4,550,534
4,550,543
4,550,606
4,550,637
4,550,662
4,550,669
4,550,679
4,550,713
4,550,722
4,550,728
4,550,734
4,550,826
4,550,841
4,550,843
4,550,903
4,550,916
4,550,943
4,551,004
4,551,006
4,551,007
4,551,008
4,551,017
4,551,018
4,551,039
4,551,049
4,551,058
4,551,086
4,551,106
4,551,114
4,551,129
4,551,130
4,551,135
4,551,149
4,551,152
4,551,175
4,551,192
4,551,198
4,551,202
4,551,224
4,551,236
4,551,295
4,551,333
4,551,340
4,551,343
4,551,348
4,551,363
4,551,373
4,551,411
4,551,436
4,551,488
4,551,496
4,551,515
4,551,530
4,551,535
4,551,563
4,551,595
4,551,620
4,551,657
4,551,689
4,551,704
4,551,784
4,551,810
4,551,826
37 : 4,550,476
4,550,484
4,550,579
4,550,670
4,550,880
4,550,976
4,551,190
4,551,200
4,551,201
4,551,282
4,551,472
4,551,591
4,551,671
39 : 4,550,517
4,550,525
4,550,540
4,550,549
4,550,561
4,550,587
4,550,683
4,550,689
4,550,711
4,550,756
4,550,764
4,550,824
4,550,827
4,550,835
4,550,844
4,550,862
4,550,863
4,550,890
4,550,922
4,550,947
4,550,953
4,550,961
4,551,027
4,551,056
4,551,069
4,551,088
4,551,122
4,551,124
4,551,136
4,551,154
4,551,156
4,551,178
4,551,187
4,551,191
4,551,361
4,551,368
4,551,376
4,551,390
4,551,391
4,551,407
4,551,442
4,551,445
4,551,503
4,551,506
4,551,511
4,551,550
4,551,610
4,551,631
4,551,668
4,551,675
4,551,702
4,551,740
4,551,792
40 : 4,550,621
4,550,677
4,550,779
4,551,041
4,551,181
4,551,227
4,551,230
4,551,431
4,551,444
4,551,573
4,551,766
41 : 4,550,460
4,550,468
4,550,510
4,550,526
4,551,025
4,551,047
4,551,636
4,551,656
4,551,715
4,551,732
4,551,734
42 : 4,550,445
4,550,478
4,550,494
4,550,531
4,550,614
4,550,620
4,550,622
4,550,630
4,550,717
4,550,766
4,550,767
4,550,778
4,550,791
4,550,811
4,550,825
4,550,889
4,550,898
4,550,900
4,550,905
4,550,931
4,550,941
4,550,956
4,550,959
4,550,960
4,550,975
4,551,050
4,551,098
4,551,108
4,551,126
4,551,161
4,551,179
4,551,219
4,551,298
4,551,299
4,551,349
4,551,388
4,551,425
4,551,429
4,551,435
4,551,456
4,551,486
4,551,500
4,551,534
4,551,538
4,551,553
4,551,559
4,551,597
4,551,682
4,551,754
4,551,787
4,551,798
4,551,807
4,551,827
4,551,854
44 : 4,550,749
4,550,831
4,551,110
45 : 4,550,532
4,550,548
4,550,725
4,551,151
4,551,160
4,551,380
4,551,614
47 : 4,550,761
4,550,768
4,550,929
4,550,930
4,551,339
4,551,489
4,551,520
4,551,521
4,551,523
48 : Re.32,021
4,550,465
4,550,562
4,550,599
4,550,605
4,550,646
4,550,742
4,550,780
4,550,781
4,550,782
4,550,789
4,550,842
4,550,942
4,551,075
4,551,077
4,551,107
4,551,223
4,551,225
4,551,239
4,551,293
4,551,309
4,551,443
4,551,446
4,551,510
4,551,567
4,551,641
4,551,678
4,551,717
4,551,776
4,551,823
4,551,824
4,551,830
4,551,831
49 : 4,550,554
4,550,610
4,550,748
4,550,755
4,550,790
4,550,839
4,550,978
4,551,100
4,551,819
51 : 4,550,495
4,550,498
4,550,721
4,550,966
4,550,974
4,551,111
4,551,338
4,551,549
4,551,646
4,551,726
53 : 4,550,530
4,550,686
4,550,925
4,550,926
4,551,042
4,551,286
4,551,305
4,551,612
4,551,627
4,551,723
4,551,781
54 : 4,551,498
4,551,547
4,551,566
55 : 4,550,542
4,550,572
4,550,676
4,550,697
4,550,720
4,550,771
4,550,775
4,550,776
4,550,952
4,551,331
4,551,371
4,551,739
4,551,800
56 : 4,550,804

DESIGN PATENTS

01 : 281,239
04 : 281,200
281,201
281,232
05 : 281,212
06 : 281,219
281,221
281,245
281,247
281,249
281,260
281,268
281,274
281,278
08 : 281,258
281,272
09 : 281,236
281,280
12 : 281,207
281,213
281,266
13 : 281,273
18 : 281,209
281,269
24 : 281,203
25 : 281,224
281,225
281,279
26 : 281,283
27 : 281,205
281,230
281,284
29 : 281,267
32 : 281,277
34 : 281,228
281,237
281,261
281,262
281,263
36 : 281,211
281,242
281,243
281,246
281,253
281,281
37 : 281,220
281,231
39 : 281,217
281,240
281,250
281,264
42 : 281,204
45 : 281,218
48 : 281,208
281,216
50 : 281,202
53 : 281,275
55 : 281,270

PLANT PATENTS

34 : 5,579

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01 : T106,002
37 : T106,001

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*